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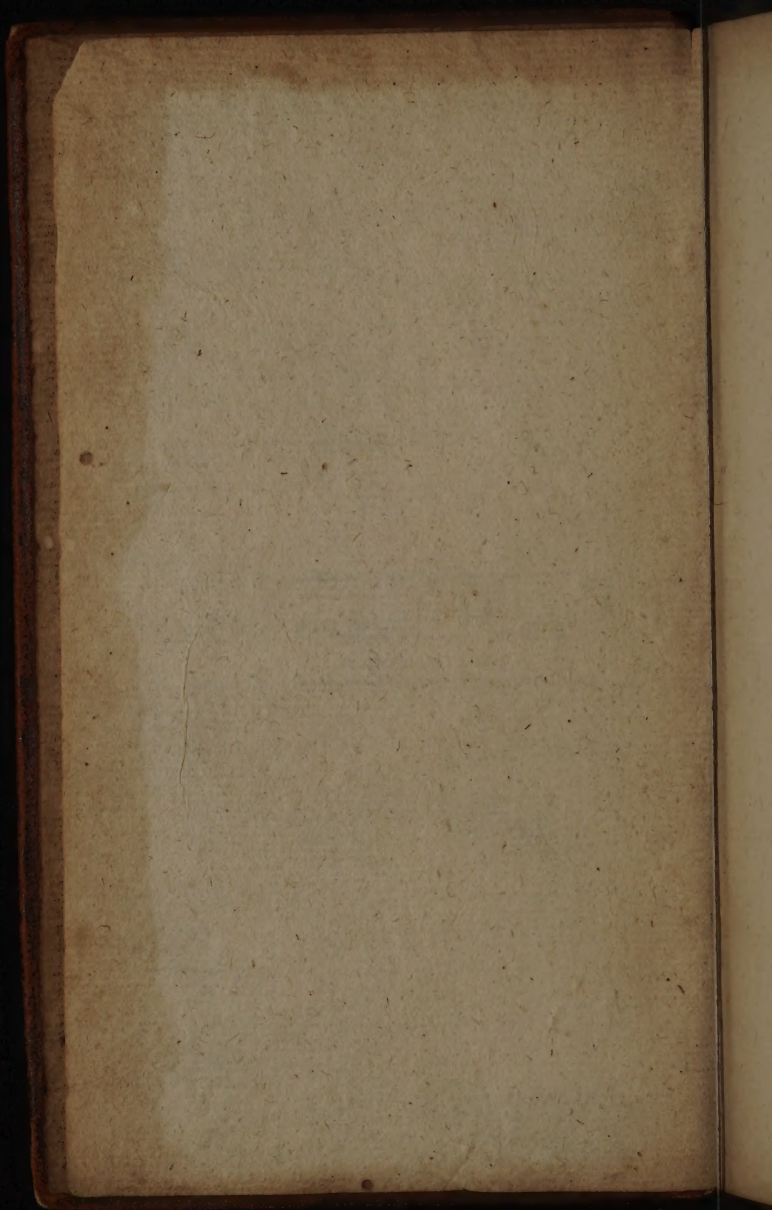
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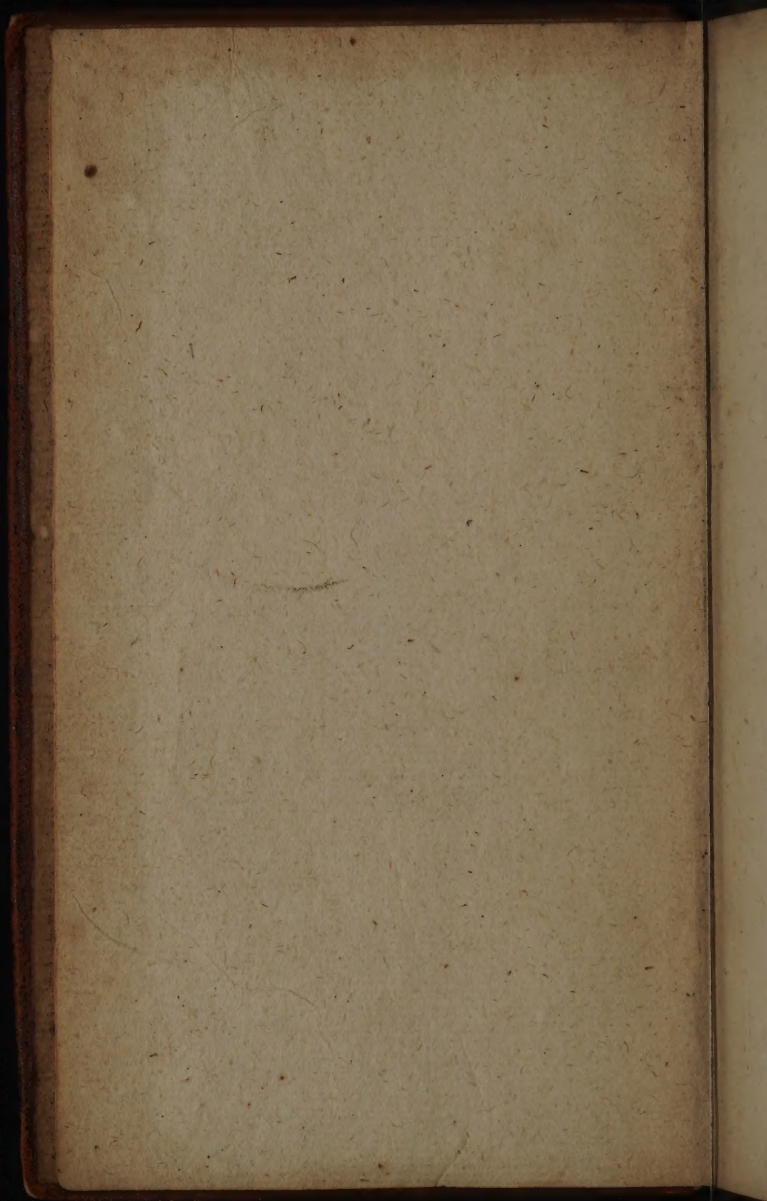
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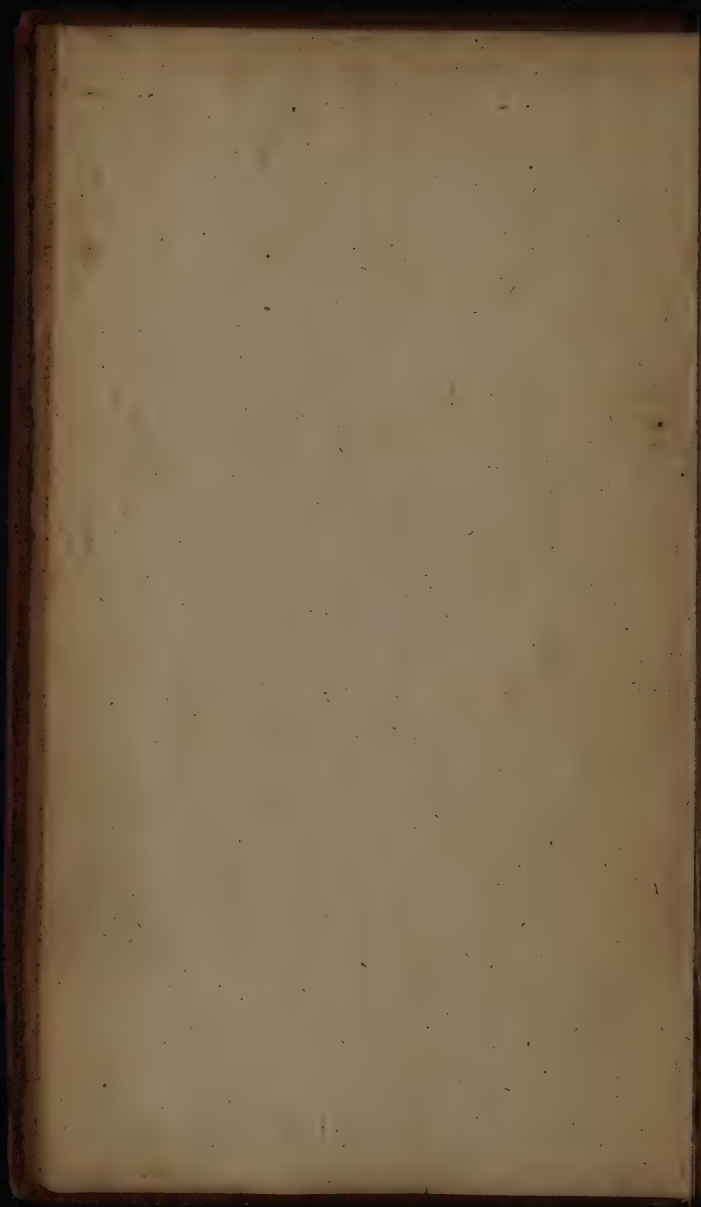
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Curiosities in Chymistry:
BEING NEW
EXPERIMENTS
AND
Observations
Concerning the
PRINCIPLES
OF
Natural Bodies.

Written by a Person of HONOUR,
and Published by his Operator, H. G.

L O N D O N :

Printed by H.C. for Stafford Anson, at
the Three Pigeons in St. Paul's
Church-yard, 1691.



NEW
EXPERIMENTS
AND
OBSERVATIONS.
Concerning the
PRINCIPLES
OF
NATURAL BODIES.

The Introduction.

THE Ingenious Author of this
Treatise has herein laid a
great many Experiments and Obser-
vations together, in order to prove
B that

that Water is the only first Material Principle of Natural Bodies ; and that all the other pretended Hypostatical Principles are ultimate and reducible into mere Elementary Water. Wherefore to give a brief and perspicuous account of his Reasonings upon this Subject, he has thought it expedient to reduce them to the following Propositions.

Sect. I. *The Ardent Spirits of Vegetables are nothing else but the Oleous Particles of these Vegetables subtilized by Fermentation, and thereby dissolved in, and united to some part of their own Phlegm.*

FOR *Lavender, Rue, Marjoram, &c.* distilled without addition, and without a previous Fermentation, afford an Oyl, but never yield any burning Spirit. Whereas after Fermentation they yield an ardent Spirit, but no Oyl; which is a manifest proof, that the inflammable Oyl is converted into an inflammable Spirit : especially, since by the lasting action of the Air upon this Spirit, the Oleous part will at last be brought to separate it self from the phlegm
and

and swim above it. Moreover if you pour Oyls in small quantity upon Fermenting Vegetables, they will come over in Distillation in the form of Spirits.

As for *the Spirits of Aniseeds, Wormwood, and such other Oleous and Aromatick Vegetables*, that are prepared with Spirit of Wine without any previous Fermentation; they are nothing else but the Oyls of these Vegetables that the Spirit of Wine has imbibed and carried up along with it in Distillation. For this Spirit, being it self no other thing than the Oyl of Wine Dissolv'd in Phlegm, will presently imbibe any Aromatick Oyl dropt into it. Hence it is, that, in the Preparation of Spirit of *Aniseeds*, the Oleous part of the Spirit of Wine imbibes as much of their Oyl as it can receive, and the rest (for they abound with Oyl) being joyn'd with the Phlegmatick part of the Spirit of Wine, compose a Milk-coloured Liquor, (as all Oyls do when they are mixed with Water, which we see daily in the Preparation of Emulsions) whose Oily parts may be imbibed by fresh Spirit of Wine, and by that means yield Spirit of *Aniseeds* anew.

Finally, 'tis upon the account of their Oleous nature, that ardent Spirits are so Inflamable; and that they so much weaken

the Corroding Acidity of *Aqua fortis*, as to render it innocent enough to be taken inwardly, though they themselves be endowed with a certain Volatile Acid.

Sect. II. *The Spirits of Vegetables, made by Incineration, are nothing else but the Volatile Salts of the Tartar of these Plants, dissolved in their own Phlegm.*

FOR they consist of the *Effluvia* that ascend from the Plants, while their Tartar is a Calcining into a fixt Salt, kept from flying away into the Air, by reason of the peculiar structure of the Furnaces, &c. employed in this kind of Incineration: and are therefore altogether of the same nature with Spirit of Soot, or even with the genuine bitterish Alkaline Spirit of *Tartar of Wine*. *N.B.* Since in the Juice of Grapes, the Alkali and Acid, mutually Coagulated, obtain the name of *Tartar*, Why should not the same Salts, con-coagulated in the Juices of other Vegetables, though endowed with very different Seeds, obtain the same Appellation, rather than that of *Essential Salts*? For there is really, in the Juices of all Vegetables, a Tartar not unlike to that of Wine. So that the Spirits, prepared by the Incineration of Plants, do, like

like that of *Vinous Tartar*, proceed from the Tartars of these Plants; which seeing they consist of the same Salts, namely Alcaly and Acid, those Spirits are indeed nothing else but these Salts in a Fluid state. Hence if genuine *Spirit of Tartar* be drawn off from an Alcalifate Salt, the Volatile Acid being left in the fixt Alcaly, it will strike your Nose with the pungent scent of a Volatile Urinous Salt.

Sect. III. *The Alcaline Urinous Spirits of Animals are nothing else, but the Volatile Salts of these Animals, dissolved in a little of their own Phlegm.*

FOR, 1. If you put Spirit of Urine, or any other Urinous Spirit, well rectified, into a glass conveniently shaped, a gentle heat will sublime good store of dry Volatile Salt into the slender neck of the Glass, leaving a weak Phlegmatick Liquor in the bottom; which would be mere insipid Phlegm, if it could be perfectly freed from the Volatile Salt that 'tis yet impregnated with, and from the subtle Particles of Oyl that generally, if not constantly, ascend together with these Spirits, and continue invisibly mixed with them (though never so well rectified, even to a

perfect transparency) for a long time, till at length by the action of the Air, or evaporation of the Volatile Salt (if the Glass be not very well stop'd) or the intestine motion of the parts of the Liquor, *though it be*, the Particles of Oyl begin to separate themselves from the rest of the Liquor, and gather together into numerous little drops, which, though they be singly invisible, yet render the whole Liquor muddy and of a reddish colour.

2. In the Distillation, for instance, of Fermented Urine, or of Sal Armoniack mingled with a fixt Salt, usually the Volatile Salt sublimes at first in a dry form; but if you continue the Distillation, so much of the Phlegm will ascend as shall dissolve all your Volatile Salt, and wash it it down into the Receiver, where you have it in the form of a Spirit. 3. If you dissolve, in common Water Distilled, as much Volatile Salt of Human Blood (for instance) as it will take up, and Distil this mixture, you will by that means obtain a Liquor, that by its smell, tast, and divers Operations, appears to be a good brisk Spirit of Human Blood; as that incomparable promoter of Experimental Philosophy, Mr. Boyle, has observed in his late useful Treatise about *Human Blood*.

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The same is to be said of the Alcaline Spirits, that are Distilled from Peas, Beans, and some other Vegetables : For they appear by divers effects to be much of the same nature with Urinous Spirits.]

SECT. IV. *The Acid Spirits of Minerals (as Sea-salt, Vitriol, Sulphur, &c.) are nothing else but the Acid Salts of these Minerals freed from the more Terrestrial Parts, united with a little Phlegm, and so reduced into a fluid state by the force of the fire.*

FOR you may reduce them to a dry Salt by pouring them upon an Alcaly. For instance, Spirit of Vitriol, after it has been employed to corrode Iron, and the superfluous moisture evaporated, recorporifies into Vitriol. And Spirit of Nitre, fatiated with Salt of Tartar or any other fixt Salt, turns into Nitre again after evaporation. Moreover these Acid Spirits are often found upon the Corks (that stop the Glasses wherein they are kept) in a dry saline form.

The same is to be said of the Acid Spirits of Vegetables, as that of Vinegar, Tartar, Guaiac, &c. which are nothing else but Essential Salts dissolved in Phlegm.

SECT. V. *The Oyls or Sulphurs of Vegetables are nothing else but Volatile Salts concentrated, in union with an unctuous inflammable Acid; which by its unctuousity hinders them to mix readily with Water, as all Salts use to do.*

Therefore *Helmont* often affirms, that Vegetable Oyls may be turned into Volatile Salts. But however that be, being joyned with fixt Salts, they turn into a Soap; and if they be frequently drawn off, they are thereby at last resolved into mere Elementary Water: which is also true of all Fermented ardent Spirits, since they are but Oyls dissolved in Phlegm. Thus Spirit of Wine, drawn off from Salt of Tartar, leaves its seminal Acid behind it, and comes over weak and Phlegmatick: and if this abstraction be often reiterated, it is thereby at length resolved into pure Elementary Water, as will be more fully declared hereafter.

There is a certain Vegetable Sulphur, found in Charcoals before they be burnt to ashes, by vertue whereof they glow. It is separated by means of Alkali's and Precipitation. This *Sulphur* is of a golden colour, and of no contemptible use: but
if

if the Charcoal be Distilled in a Retort with an open fire, it turns, like all other Sulphurs, into an Acid Spirit, which being poured upon the fixt Salt of the *Caput mortuum*, makes an effervescence with it, and so is Coagulated into a Salt.

Sect. VI. *The Sulphurs of Animals, namely Oyl and Fat, are also nothing else but Volatile Alcaline Salts concentrated, and somewhat suppressed by an occult Acid (that is not manifest to sense) so that they cannot make any Effervescence with manifest Acids.*

THESE Volatile Salts may be discovered after the very same manner with those of Vegetable Oyls. Yea, sometimes Dogs-grease, for instance, exposed in a Glasse to the Sun, sublimes into a Volatile Salt without any other art: and 'tis, upon the sole account of this Volatile Salt, that it has been found beneficial to the exulcerated Lungs of Consumptive persons. The Oyl of Harts-horn also may be sublimed into a Volatile Salt.

Sect.

Sect. VII. *The Acid Oyls of Minerals (as Vitriol, Sulphur, Allom, Sea-salt, &c.) are not true Oyls, but Acid Salts concentrated; and differ not from the fore-mentioned Acid Spirits of the same Minerals, but in that they are less diluted with Phlegm.*

Sect. VIII. *All Mineral Sulphurs, if they be kindled, turn into a very Acid saline Spirit.*

THE fixt incombustible Sulphurs of Metals, that *Helmont* speaks of, are (if there be any such Sulphurs) reducible into a Salt, since the same Author informs us, that the Metals themselves may be totally reduced to an æquiponderant Salt, and this into insipid Water.

As for the Earthy part of Natural Bodies, being useless and of no activity, it scarcely uses to be reckoned amongst the Principles. And however *Helmont* informs us, that the *Liquor Alcahest* turns this Earth into Water, by depriving it of its Essence, i. e. of its seminal vertue.

From what has been said it appears that all those substances, that the vulgar Chymists obtain from Bodies by the Fire, and
style

style Principles, are reducible to Salts and and Phlegm (or Water.) Now our ingenious Author goes on to prove, at great length, that even,

Sect. IX. *All sorts of Salts, whether Acid or Alcalisate, Fixt or Volatile, are finally reducible to Elementary Water.*

HERE first of all 'tis to be acknowledged, that *Salts do naturally exist in Bodies before they have suffered the Fire*: although in many Bodies, as Woods, Flints, &c. the *Salts* are so bound up, by reason of the close contexture of the Parts of these Bodies, that *they* cannot easily be put into motion and dissolved, and therefore do not affect the Organs of tast, 'till the concretion of the Parts be dissolved, and the scattered saline Particles be brought together and Colligated by the Fire. Nor is it true, that the Terrestrial Particles are turned into Salts by the Operation of the Fire: for, Why is it then that Ashes, once Elixivated, will not yield one grain more of Salt, though you Calcine them again? Why do not any Terrestrial Particles acquire a saline tast by the Operation of the Fire? But yet,

Sect.

Sect. X. *The fixt Salts of Vegetables, prepared by Calcination, were not naturally pre-existent in that form, but are produced of the Volatile Salts, colligated amongst themselves and with the Earthy Particles, by the force of the Fire.*

TIS true, there naturally exists, in the Juice of Grapes and of all other Vegetables, a Tartar so fixt as to be inodorous, and to endure the Air (though not the Fire) without flying away. Which fixtness proceeds from the Acid, that saturates the Volatile Alkali of this Tartar; as we see in the Volatile Salt of Urine, Soot, &c. which being fatiated with Spirit of Salt, are thereby fixed into Sal-Armoniack, that has no smell. The Fermentation of the Juices, pressed out of Apples, Pears, &c. is a manifest proof of this Tartarous Salt; for there can be no Fermentation without Acid and Alcaly, which are the constituent Principles of Tartar. But there is no Salt, pre-existent to Calcination in any Vegetable, so fixt as to endure the Fire as well as the Air. For,

First, the ordinary way of preparing fixt Salts, is, by burning the dried Vegetables

bles to Ashes in an open Fire, Lixiviating these Ashes by decoction in common Water, and exposing this Lee to some heat, 'till the greatest part of the Water being Evaporated, the saline Particles, formerly dispersed in the Pores of the Liquor, unite together for want of room into Crystals, of different Figures; according to the diversity of the seminal Acid. Others Distill a certain Acid seminal Spirit from the Plant, reduced to Ashes by a moderate Fire, and Lixivate the Salt that remains in the retort with this Spirit. Again others, instead of this Acid, cast a little *Sulphur* upon the Salt, when 'tis highly Calcined, *whose* seminal Acid gives a certain *form* to the Salt, in place of *that* which the extreme Calcination had destroyed; lest, if the Salt were wholly destitute of a seminal Acid, it should resolve into Elementary Water, as shall be made out hereafter. But *Tachenius's* method is the best; namely, to reduce the Plants, whilst they are fresh and green, into black Ashes with a very gentle Fire, so as they may not break out into a manifest flame; to Calcine these Ashes to whiteness in an Earthen Pot over the fire, stirring them ever now and then; after this to Lixivate them with common Water; to evaporate the Lee to the consistence of

of Honey ; then to urge it with a moderate Fire to brownness : and last of all to dissolve and Chrystallise it. One pound of Ashes, prepared after this manner, will yield near four ounces of very pure fixt Salt : whereas four pound Calcined by the former methods , will scarce yield one ounce. The reason of so great a difference, depends partly upon the greenness of the Plants, and partly upon the moderateness of the Fire imployed to Calcine them. For dried Plants (for instance *Wormwood*) do always afford less fixt Salt than green ones ; whence it manifestly follows, that by Exsiccation some Saline Particles are carried away with the Aqueous ones, which would have composed a part of the fixt Salt, if the Plant had been Calcined while it was green : now these Salts could not fly away unless they were Volatile. Again, as the Volatile Salts of a Plant are spent by the action of the Air in Exsiccation, so are they likewise by the action of the Fire in Calcination ; and this so much the more, by how much the Fire is more violent ; for the Particles of a *manifest flame*, being in exceeding quick motion, excite the Volatile Salts to a swifter motion, and consequently a more copious avolation, than those of a gentle smothering Fire.

Secondly,

Secondly, If you take the *Soot* that ascends in the Calcination of Tartar, (otherwise called the *Spirit of Tartar*,) and put it back again to the *Caput mortuum*, you will thereby much increase the quantity of the fixt Salt : And if all the Volatile saline Particles of Tartar could be kept from flying away in Calcination, they would all turn into a fixt Salt. But if all of them were driven away, 'twere not possible to obtain one grain of fixt Salt : which yet never happens, because they cannot all fly away at once, but one after another ; so that those, which were to fly away last, are by reason of their longer stay in the fire, Colliquated, and so fixed ; and that partly by the Acid Particles that feed the flame (and condense the smoak into Soot) and partly by the Earthy Particles, commixed with the Volatile Salts that are Coagulated in the Fire.

Thirdly, 'Tis impossible to extract one grain of fixt Salt from any Vegetable, nor yet calcined to Ashes, that is, so long as there remains any smoke, or the least motion, of the Vegetable Particles (such as we see in glowing Charcoal ;) but when this motion ceases, 'tis a sign that all the remaining Particles are Coagulated and fixed.

Fourthly,

Fourthly, Soot is nothing else but a heap of Volatile Particles Coagulated together, and yet by Calcination it affords a considerable quantity of fixt Salt; which must proceed from the Colliquation of the Volatile Salts, since there can be none but such in Soot: for fixt Salts are so constant in the Fire that they cannot ascend in the form of Flame or Smoak, and consequently cannot enter the composition of Soot. And that the *Salts* of Soot are Volatile, is also manifest from hence, that, by means of Spirit of Salt, *they* may be turned to Sal-Armoniack, and consequently (when the Acid Spirit is separated by the addition of a fixed Alkali) into a Volatile and highly Urinous Salt. So that the matter, of which the fixt Salt of Soot consists, are these Volatile Salts of Soot, one Acid and another Urinous, Colliquated together and with the Terrestrial Particles, by the force of the Fire. Nor can it be said, that the *fixt* Salt of Soot was carried up by the *Volatile*; for (besides that there was no fixt Salt pre-existent in the mixt Body) by this means it would be no more a fixt but a Volatile Salt: and if we consider the proportion of the fixt Salt of Soot to the weight of the Soot it self, it will easily appear, that Soot contains not enough of

Volatile

Volatile Salt to elevate such a quantity of *Fixt*, since that ought to exceed *this* almost in a triple proportion. Thus *though* if you mingle *fixt* Salt of *Tartar*, with a sufficient proportion of *its own*, or any other, *Volatile* Salt, and commit this mixture to sublimation, our Author denies not but that some parts of the *fixt* Salt will be elevated by the other Salt; yet he affirms, that these are not integral parts, but have lost the nature of a *fixt* Salt, and are really turned into a *Volatile* one, because this sublimation separates them from the Terrestrial Particles, their union with which was the only thing that kept them in a *fixt* state. In the like manner *Spirit of Wine*, being digested with *fixt* Salt of *Tartar*, and drawn off by Distillation, carries along with it some of the saline Particles (whence it is said to be *Tartaris'd*,) but no Terrestrial ones, and consequently no *fixt* Salt but a *Volatile*. Again, as 'tis impossible to obtain one grain of *fixt* Salt from Soot, before a violent Calcination, so the quantity of the *fixt* Salt is increased by all the same methods that restrain the *Volatile* from flying away in this Calcination: namely if it be Calcined in a close Vessel, with an intense Fire at the beginning, (that the *Volatile* Salts may be the sooner colligated, be-

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fore

fore they can have time to fly away) then beaten, and kept stirring over the Fire 'till it be of a cineritious colour. The Soot also, that ascends in the Calcination of Soot, being put back again to the *Caput Mortuum*, increases the quantity of the fixt Salt.

Fifthly, Whatsoever separates the Terrestrial parts from any fixt Salt, does at the same time destroy its Fixity, and Volatilise the saline parts. Which our Author makes out by several Experiments. 1. If you pour Spirit of Salt, by degrees, upon a Lee of Salt of Tartar, (or of any other Alcalifate Salt,) 'till it be almost satiated, (which is known by the abating of the Effervescence,) you shall observe a kind of Earth precipitate out of the fixt Salt, (namely because, *upon the mutual conflict, between an Acid and an Alkali, whatsoever heterogeneous substance is contained in either of them uses to precipitate.*) The Earthy part of the Salt of Tartar being thus separated, the *saline* part is thereby render'd Volatile, and would actually fly away, were it not for the Acid that fixes it anew: and if you separate this Acid, by the addition of new Salt of Tartar, it will by this means be set at liberty, and strike your Nostrils with an Urinous odour. Thus, if you separate the Liquor from the precipitated Earth

Earth by Filtration, then reduce it to Crystals by evaporation, and last of all, mingle an equal quantity of Salt of Tartar, with these Crystals in a Mortar; the Acid Spirit will joyn it self to this new Salt of Tartar, and so the Volatile Alkali, being freed from the Acid, flies away. Nor can it be said, that the forementioned Earth did but externally adhere to the Salt of Tartar, and was not intimately united with it by Colligation; since the experiment succeeds with Oyl of Tartar *per deliquium*, though it be clear and limpid like Rock-water: but observe, that the Earth does not fall out of the Pores of the Oyl of Tartar, 'till the Salts have attain'd the point of saturation, and then the Liquor, that was limpid before, begins to look troubled; and when the Glass has stood a while, a whitish colour'd substance settles to the bottom. But the Volatile Salt, that is separated from the Oyl of Tartar, is weaker than that which is separated from the dry Salt; because Salts approach so much the nearer to the nature of Elementary Water, by how much the easier they run *per deliquium*. 2. In the very same manner, and for the same reason, a Volatile Urinous Salt may be obtain'd from the *Caput mortuum* of Sal-Armoniac, by the ad-

dition of new fixt Salt. For in Sal-Armoniack there is a somewhat fixt Acid Spirit, combined with the Volatile Salt of Urine and Soot; which Acid, being imbib'd by the Salt of Tartar, (that is mingled with the Sal-Armoniack immediately before Distillation,) the Volatile Salt is set at liberty, and presently flies away. And in the mean time, the forementioned Acid dissolves the Union, between the Earthy and Saline Particles of the Salt of Tartar, and thereby renders the saline ones Volatile; which therefore, so soon as they are freed from this Acid, by the addition of new Salt of Tartar to the *Caput mortuum*, do presently ascend, even without Fire, with a most piercing Urinous odour. And even from this second *Caput mortuum* you may obtain a Volatile Salt, by the addition of a third portion of Salt of Tartar.

3. The Volatilisation of Salt of Tartar, by the help of Vinegar, depends upon the same Principle. For they pour Vinegar upon the Salt of Tartar, and draw it off very Phlegmatick; for the Acid Salt is left in the Salt of Tartar. Then they pour on fresh Vinegar, and abstract it as before; and reiterate this Operation so often, 'till the Vinegar came over as Acid as when it was poured on: which is a sign that the Salt

Salt of Tartar is now satiated with the Acid of the Vinegar, and consequently Volatilis'd by the separation of the Earth that fix'd it. For if you pour Vinegar upon the Lee of Tartar, to the point of saturation, the Earth of the Tartar will presently precipitate. 4. The Preparation of *Balsam of Samech* is of no small affinity to this; namely, the Volatilisation of Salt of Tartar, by a frequent abstraction of Spirit of Wine from it. For the Spirit that is first poured on, though it were highly rectifi'd, comes off Phlegmatick, with very great loss of its igneous vertue; because 'tis in great part turned into a Water, by being rob'd of its seminal Acid. But, so soon as the Salt of Tartar is fully satiated with this Acid, (which cannot be without reiterating the abstraction of fresh Spirit a great many times, since Salt of Tartar requires a great quantity of the strongest Vinegar to satiate it, though the Acidity of Vinegar be manifest and more fixt, whereas that of Spirit of Wine is occult and Volatile,) and the Spirit comes off without loss of strength, the Alkali of the Tartar is found to have been Volatilis'd, by being separated from the Earth that fix'd it. Hence you may observe a sweetness in the Spirit of Wine Tartarised,

which argues, that the Acid Particles of the Spirit are Converted into sweet ones, by being Coagulated in the Alcalifate ones of the Salt of Tartar that ascend with them ; in like manner as when Vinegar is Coagulated in *Saturn* or *Mars*. N. B. 'Tis not necessary, in this Operation, to separate the Acid from the Volatilis'd Alcaly, before this Alcaly can be made to ascend, as it was in the Experiments made with Spirit of Salt and Vinegar ; because the *Acid of the Spirit of Wine* is much more Volatile than that of Spirit of Salt or Vinegar, and therefore, tho' it be Coagulated in the Volatilis'd Alcaly, yet it hinders not it's Volatility. 5. The same Observation holds of Oyl of Cinnamon (and the like Distil'd Oyls) which being long Digested and Circulated with it's own *Fixt Salt*, Volatilizes it, and is together with it totally converted into a Volatile Salt, if *Helmont* rightly informs us. And 'tis easy to understand the reason of this, if we consider that there is an Acid in all distill'd Oyls, as well as in Spirit of *Wine* and all other Inflamable Substances ; which we shall manifestly prove hereafter. 6. In the Fermentation of Salt of Tartar with its own proper Ferment, namely Crude Tartar ; the Acid

of

of the latter Precipitates the Earth of the former ; (from eight ounces of each the Author has seen two Drams of Earth separated) but the Volatilis'd Alcaly, being kept under the power of this Acid, does not yet manifest it self: so that the Volatile Urinous Salt which is obtain'd from hence, does not so much proceed from the Salt of Tartar, as from the Crude Tartar, on which the Salt of Tartar operates in this case, much after the same manner as it uses to do as *Sal-Armoniac*. Which is the more probable, because a very piercing Urinous Salt may be obtain'd from Crude Tartar alone, without any Salt of Tartar, only by the addition of an equal weight of Crude Alum, as *Dan. Ludovicus* informs us. 7. Oyl of Tartar *per deliquium*, digested with Flowers of Sulphur in a gentle heat, emits Particles extremely Urinous ; which effect the Author attributes to the Acid of the Sulphur : and adds, that, having had occasion to reduce *fatid Oyl* of Harts-horn into a soap with a certain Alcalisate Salt, the Glass grew warm without any External Heat, and a strong Urinous Odour pierc'd his Nose. [I am apt to think that this Odour came not from the Alcalisate Salt, as the Author seems to believe, but from the Oyl of Harts-horn,

which without doubt contains an Urinous Salt in it. And if it contain an *Acid* also, as the Author thinks it does, the Incalescence might proceed from some conflict betwixt this & the Alcalisate Salt, which being united together, the Urinous Salt was perhas thereby set at liberty from the Acid that formerly detain'd it.] The like Odour is observable in the Salt produc'd by frequent abstraction of Spirit of Wine from Salt of Tartar : Where the Author observes that some, after they have several times pour'd Spirit of Wine upon warm Salt of Tartar and abstracted it again, do last of all pour on Oyl of Vitriol, and then obtain the Volatile Salt by the addition of fresh Salt of Tartar. Which Experiment, tho' the Author has not try'd, yet he judges it may succeed ; since the Terrestrial parts of the Salt of Tartar may be separated by the Oyl of Vitriol, and the Alcaline parts, being united with this Acid, may be set at liberty by the addition of new Salt of Tartar.

Here the Author takes occasion to discourse of the Vertues of Salt of Tartar *Volatilis'd*, and affirms that it has no peculiar Effects, (neither in the Curing of Diseases, nor in the Dissolution of Bodies,) but what other Urinous Salts do likewise produce.

produce. But yet he acknowledges a Specifick Difference between them, upon the account of the Seed in the Acid of Tartar, which differs from the seeds of other Acids: and in this respect other Urinous Salts do also differ from one another; since the renowned *Boyl* has observ'd, that the *Volatil Salt of Harts-horn* resembles a *Parallelopiped*, but that of *Human Blood*, digested with Spirit of Wine, is like a *Rhombus*. This diversity of Figure is owing to the different Seeds or *Idea's*, as residing in the Acids, that are the causes of the Solidity and Coagulation of these Salts: Wherefore the *Fixt Salt of Tartar* Crystallis'd does also resemble a *Rhombus*, because the Seminal Acid of this Salt, is of the same kind with that of the Spirit of Wine, which being stronger than the Seminal Acid of the foremention'd Volatile Salt of Blood, this Salt is Coagulated according to the *Idea* of the Vinous Acid: even as, when Spirit of Nitre is pour'd upon Salt of Tartar, the Acid of the former being the more powerfull, forms the Crystals of an Oblong figure like Nitre, but not like Salt of Tartar, which resembles a *Rhombus*. The Author concludes, that this Seminal difference of Volatile Alcalies is of little moment in Medicine, since all Alcalies,
even

even the purest, are endow'd with so much of a Seminal Acid, as does indeed preserve them from a Spontaneous resolution, into Elementary Water, but yet hinders them not from being in a capacity to imbibе this or that Hostile Morbific Acid indifferently. The same thing is to be said of the fixt Alcalisate Salts of Vegetables, for the Seminal Vertues are lost in the Calcination, and there remains only so much of a seminal Acid, as keeps them from relapsing into Elementary Water, and does indeed cause them to differ specifically from one another, but not to produce different Effects in Medicine.

From all the foremention'd Particulars, concerning the *Volatilising of Fixt Salts*, our Author concludes, that there can never be any Method found out to effect it, but by separating the Terrestrial Particles. As for *Zwelfers Volatile Salt of Tartar*, prepar'd by often reiterated Solutions (*per deliquium*) and Abstractions, he affirms that 'tis nothing else but *useless Elementary Water*; as will manifestly appear to him that considers, that *Alcalisate Salts* are fundamentally nothing else but *Aqueous Particles*, converted by a little Seminal Acid into rigid Salts, which, as soon as the Acid is destroy'd, turn again into Water: where-

wherefore the more violent the Calcination is, and by consequence the greater your loss is of this feminal Acid, they are the more easily resolv'd *per deliquium* in moist Air, which by it's vertue, as a *Menstruum*, does in great part consume the little Acid that remains, and thereby resolve a great part of the Alcalifate Salt into Elementary Water, wherein the other Particles, not yet depriv'd of their Seed, do swim, (for when Salts approach to the nature of Water, they are readily dissolv'd in it;) but if the Water be abstracted from them, and they expos'd to the Air again, their remaining Acid is destroy'd, and they resolv'd into Water in great part: and if they run *per deliquium* and be abstracted often enough, all the Seminal Acid will be at length destroy'd, and nothing remain but bare Elementary Water, which will all of it easily ascend. And by this means any Fixt Alcalifate Salt may be totally reduc'd into Elementary Water.

Sect.

Sect. XI. **T**HE Volatile Salts of Vegetables, since they are the Matter of which (Colliquated with the Acid and Terrestrial Particles) the Alcalifate Salts consist; And the Volatile Salts of Animals, since (as the Author has prov'd) they differ not essentially from those of Vegetables; are both of them ultimately reducible into Elementary Water.

Sect. XII. **A**CID Salts, made fluid by the force of Fire, and drawn off from fixt Alcalies, may be thereby so rob'd of their Acid, that nothing will ascend but Elementary Water. And the Alcalifate Salt, that has imbib'd the Acid, being frequently resolv'd *per deliquium* and the Phlegmatic part as frequently abstracted, may by this means be at length totally converted into pure Elementary Water.

Thus the Author having particularly examin'd the pretended Chymical principles, and found them all ultimately reducible into Elementary Water; Concludes that

Sect.

Sect. XIII. **A** *L L Mixt Bodies are made*
up of Water, as the only first
Material Principle and Seeds (which differ
according to the differing species of Bodies)
as the Formal Principle, united together by
means of Acid Ferments : That is to say,
Water is Coagulated into a Plant, by the
Ferment of a Vegetable Seed ; into a Metal,
Stone, &c. by that of a Mineral Seed ; and
into Flesh , Bones , &c. by the Fer-
ment of an Animal Seed. For in all Mixt
Bodies there are certain Acid Particles,
wherein the Seeds or Ideas of Natural things
do reside, and which, in Coagulating the
approximated Aliment , do follow the
draught of these Ideas, and so are thereby de-
termin'd to give it the form of this or the
other Vegetable Mineral, or Animal. Thus in
a Mans Stomach, for example, there lurks
a certain Acid, that discovers it self by
the sour belches of healthy men, and by
the Vomiting of Coagulated Milk, tho' it
were taken fluid. This Acid easily re-
ceives the Alcalical Particles of the Meat
extracted by (the Alcalical Menstruum)
the Spittle, and imprints the Idea of its
own Seed upon them, by which they are
determin'd to nourish Man only, and no
other Animal ; as afterwards , when they
 come

come to every particular Part of the Body, by the Circulation of the Blood, *they* are determin'd by the seminal Acid residing in *that Part*, to nourish *it* rather than any of the rest. And that Aliment, which has once receiv'd the Seal or Impression of the seminal *Idea* of any Animal *in the Stomach*, or of any part of the Animal *in that same Part*; will never receive the *Idea* of another Animal, nor of another Part of the same Animal, unless it be suppress'd by a more powerfull Ferment; as when Sheeps Bones, tho' furnish'd with their own proper *Ferment and Idea* yet, being unable to resist the *stronger one* of a Dogs stomach, are therein turn'd into fit nourishment for the Dog, and afterwards for his Musculous Flesh it self and other Parts, as well as for his Bones. In like manner Grass has its own Ferment and *Idea* suppress'd by that of a Cows stomach, which seals it with such an Impression, as renders it fit Nourishment for a Cow, but not for any other Animal. But if the same Grass had been taken into the stomach of a Horse, it would have been turn'd into Nourishment fit for a Horse, but unfit for a Cow or any other Animal. Again common *Mercury*, which is the Nourishment of *Metals*, is converted into this or the other Metal, according

according to the diversity of the Acid
feminal Sulphur that Coagulates it.
Finally all *Vegetables* also are endow'd with
a feminal Acid, and therefore their ex-
press'd Juices do, after long Fermentation,
tast Acid. And in the Fermentation of
Cream of Tartar with Salt of Tartar, the
Seed, Idea or *Archens*, that reside in the Acid
of the Tartar, forms certain Bubbles very
much resembling natural Grapes.

All this will be better understood here-
after, from the Authors particular expi-
cation of the nature of the foremention'd
Seeds, Ideas and Ferments : But now, to
put it past all doubt, that Water is the
only Material Principle of all Mixt Bodies,
the Author has not only prov'd that all
Substances, that Mixt Bodies can be resolv'd
into by the Chymical Art, are totally
reducible into Elementary Water ; but
likewise he proves particularly, that

Prop. XIV. *Water is the only and Catholic
Nourishment of all Vegetables, Animals,
and Minerals.*

AND 'Tis manifest that every Body
consists of the same Matter that
nourishes. 1. As for *Vegetables*, *Helmonts*
Experiment proves this beyond contra-
diction ; namely, he put 200 pound of
Earth

Earth (dry'd in an oven) into an earthen vessel, moisten'd it with Rain-water, planted it in the trunk of a *Willow Tree* weighing 5 pound, and let it alone there for 5 years time, only watering it, as need requir'd, with Rain-water or distill'd Water. [And to keep the neighbouring Earth from getting in, he imploy'd a plate of Iron tin'd over and perforated with many holes.] At the 5 years end he found the Tree had grown so well, that it weighed 169 pound and three ounces: And yet the Earth, being dry'd again, weigh'd but two ounces less than it had done at first: so that above 160 pound of *Wood, Bark, Root, &c.* had grown up out of mere Water, Coagulated by the Seminal Ferment of the Vegetable into the severall *Substances* newly mention'd. Hence *Rain* does wonderfully refresh, enervate and advance the growth of, all sorts of Plants, and without *that* they decay, wither and dye. For Water is indifferent to them all, till it be turn'd by the Ferment of the Vegetable Seed into *Leffas*, as *Hellmont* calls the Juice that is the immediate Aliment of the Plant. Thus *Wolf-bane Aconitum* and *Lavender*, for instance, growing in the same Soyl, are both nourish'd by the same Rain-water, which
by

by the Ferment of the one is Coagulated into a poysonous Herb, and by that of the other into a wholesome one.

Secondly, That *Animals* are nourish'd with Water alone, appears in *Fishes*; for they live only in the Water, and yet have no food supply'd them from any where else, nor is there any Rudiment of it to be found in their Stomachs, as *Helmont* observes. [And tho' some *Fishes* feed upon others, yet these others feed only upon Water, and therefore are materially nothing else but Water.] As for *Terrestrial Animals*; some of them, as *Horses, Cows, Sheep, &c.* feed wholly upon Water and Grass, which the Author has already prov'd to be materially nothing else but Water, and therefore that which grows in well water'd places, prospers best, others, as a *Lyon, Wolf, &c.* tho' they be not nourish'd by Grass and Water only, but feed upon other Animals, yet still their food is materially nothing else but Water, being that these Animals live only upon Grass and Water, except when they are too young to digest Grass, that they are nourish'd by their Mothers *Milk*, which also is materially nothing else but Water, since it is generated of the Mothers nutriment. [The same things are easily

D appli-

applicable to *Birds* ;] and to *Men*, which feed only upon Vegetables, Fishes, and the Flesh of Beasts that are nourish'd only by Vegetables.

Thirdly, As for *Minerals* ; Mercury is the immediate Aliment of *Metals*, and some other Minerals, and the nearest Matter of which they are produc'd. Now *Mercury* is nothing but *Elementary Water*, Coagulated by a certain *Metalline* and *Arsenical Sulphur* into such a Water as does not wet the Hands : and by other various *Sulphurs* 'tis further Coagulated into *Antimony* and divers *Metals*. Hence Mines are never found but where there is a great conflux of Water. *Gold* is gather'd out of the Sands of some Rivers. *Sand* abounds no where so much as near the Sea and great Rivers. *Stones* are nothing else but sand compacted together. [And the illustrious *Mr. Boyle* has fully prov'd in a most ingenious as well as judicious Discourse about the *Origine and virtues of Gems*, that many *Gems* and *Medical Stones* were once fluid Bodies. But 'twere too long, here to give an account of the many cogent Arguments he there imploys to prove this Assertion, which very much countenances our Authors *Hypothesis*.] The experienc'd *Helmont* informs us, that it often happens in Mines when
the

the Workmen are breaking the Rocks, that the Wall cleaves, and a little water of a whitish green Colour flows out of the cleft, & presently thickens like liquid Soap; afterwards it growes yellow or white or of a deeper green. This Juice he calls *Bur*, and affirms it to be the nearest Matter of all Minerals, and to be nothing else but *Water Coagulated by a Mineral Ferment*, as *Leffas* is by a *Vegetable*.

To make it yet more evident, that *Water* is the only first *Material Principle of Natural Bodies*; the Author undertakes to prove that

Prop. XV. *All Animals, Vegetables, and Minerals are ultimately resolvable into Elementary Water.*

[FIRST the substances that *Animals* are resolv'd into by Distillation, are Phlegm, Volatile Salt, Urinous Spirit, Oyl, and Earth or *Caput mortuum*, but very little if any Fixt Salt. The *Phlegm* is nothing else but Elementary Water, except in as far as it partakes of the Volatile Salt and Oyl, of which it always carries up some Particles, nor can it ever be perfectly separated from them.] 2. The *Volatile Salt* of *Animals* is of the same nature with that of *Vegetables*, which be-

ing Colliquated by the force of the Fire with Acid and Earthy Particles; is thereby turn'd into a Fixt Salt. And this fixt Salt being frequently deliquated, and the Phlegm as often abstracted, is at length totally resolv'd into Elementary Water. All this was abundantly prov'd before; as also that 3. The *Spirit* is nothing else but Volatile Salt dissolv'd in Phlegm. 4. The *Oily* and Fat parts of Animals may be united with an Alcalifate Salt into Soap, from which being often abstracted, they turn at length into meer Elementary Water. And this is to be observ'd of all the Fats of Animals, that by frequent Circulation with Salt of Tartar they are converted into Water. 5. [*As for the Fixt Salt of Animal Substances*, 'tis the common Opinion that *none can be abstracted from them*; perhaps because all their *Saline Parts* are so Volatile, that (to speak consonantly to our Authors *Hypothesis*) they cannot sustain a Colliquation with the Earthy Parts, especially since there are very few, if any, manifestly Acid ones to concur to *their* Fixation. But that indefatigable Searcher into Nature, Mr. Boyle, informs us, that by an obstinate Calcination of eight ounces and a half of *Caput mortuum* of Human Blood,

he

he obtain'd above seven drams of *Salt*, which, tho it were not truly Lixivial, but rather of the nature of Sea-salt, yet it was Fixt enough to endure a Calcination for two days together, without flying away. However, 'tis probable, that *this* was nothing else but some unalter'd part of the Sea-salt that season'd the Aliments, that the person or persons whose the Blood was fed upon.] 6. The Earth also may be totally resolv'd into Elementary Water, by being depriv'd of its seminal vertue by means of the *Alcahest*, if we may believe *Van Helmont*.

Hence 'tis that dead Animals, when they putrify, are resolv'd into an Aqueous Substance. And *Helmont* has deliver'd a notable Experiment to this purpose, namely, that if you dig up a Frog at full Moon, in the coldest time of Winter, (*atrocissimo hyemis borea*) wash it, and tye it to a stick in the Fields, the next morning 'twill be turn'd into a white and transparent Mucilage, not unlike to liquif'd Gum Tragacanth, but retaining the figure of a Frog. Yea he affirms that the *Cadaver* of a Man or Beast, expos'd all night to the Rayes of the Moon, will in the Morning be almost fluid with rottenness, (*putrilagine diffluet* :) so great power

has the *Moon* to reduce dead Bodies into an *Aqueous Mucilage*.

[Secondly, *Vegetable Substances* Chymically analys'd, yield Phlegm, Volatile Salt, Spirit of several sorts, Oyl, Fixt Salt, and Earth. To the first, second, fourth and sixth may be apply'd what was said of the *Phlegm*, *Volatile Salt*, *Oyl*, and *Earth* of Animal Substances. The *Fixt Salt* may be totally resolv'd into Elementary Water, by reiterated Solutions in the Air, and Abstractions, as above. There are 4. sorts of Spirits afforded by Vegetable Substances. 1. *Vinous* inflammable Spirits, which were formerly prov'd to be nothing but Oyls dissolv'd in Phlegm by Fermentation: as also that 2. *Volatile Saline* Spirits, as Spirit of Soot, Spirit of Beans (that have been kept in a dry place for some Months) &c. are nothing but Volatile Salts dissolv'd into Phlegm. And that 3. *Acid* Spirits, as Spirit of Vinegar, Spirit of Beans newly gather'd, &c. Are nothing but Acid Salts in a fluid state and united with Phlegm: and being pour'd upon *Fixt Salts*, they are together with them ultimately resolvable into Elementary Water. 4. *Adiaphorous* Spirits of Box, Guaiacum &c. Which the judicious Mr. Boyle, who was the

the first Observer of them, suspects to be generated of the finer parts of the Oyl of the Wood, reduced to an extraordinary smallness, and by that means exquisitely mix'd with the Plegm the juice of Grapes affords: all these 4 sorts of Spirits, as *Mr. Boyle* has observ'd in his excellent Discourse concerning the *Producibleness of the Chymical Principles*.

Thirdly, As for *Minerals*; We must rely upon the testimony of *Van Helmont*, whom *Mr. Boyle* concludes to be a veracious *Author*, (except in that extravagant Treatise of the *Magnetical Cure of Wounds*,) from the success he has had in trying some of his Experiments, that might seem not the most likely to succeed: [and I think we may justly lay great weight upon the judgement of so experienc'd and judicious a person as *Mr. Boyle*, concerning the sincerity of any Chymical Author.] *Helmont* then in several places informs us, that all *Stones, Gems, Marcasites, Metals &c.* may be transmuted into an equiponderant Salt, and this into Insipid Water. And as for *Metals*, it seems indeed that common *Mercury* is their nearest Matter, into which they may be resolv'd by the separation of their *Coagulating Salts*: and the famous *Langelot* has made an Experiment of this in the *Regulus of Antimony*.

Now if the other *Metals* also may be *re-*
solv'd into Mercury by depriving them of
 their *Sulphurs*, and the *Mercury* it self be
 reducible into *Water*, (by robbing it of the
Sulphurs yet remaining in it,) as *Mr.*
Boyle somewhere affirms, it may in great
 part, and as several other Authors of
 good credit attest; then it can no more
 be doubted, that all Minerals are re-
 ducible into *Water*.

[It will not be unseasonable in this place
 to mention a few Experiments, deliver'd
 in *Mr. Boyles Septical Chymist*, that do
 very much countenance the three last
 Propositions. That excellent Author then
 informs us, that about the middle of May
 he caus'd his Gardiner, to dig out some
 good Earth, dry it well in an Oven,
 weigh it, put it in a very shallow Earthen
 Pot, and set in it a Seed of *Squash* (a sort
 of Indian Pompion that grows apace)
 which he water'd only with Rain or
 spring Water. And tho the hastning
 Winter hinder'd it from attaining any
 thing near its wonted magnitude, yet be-
 ing taken up about the middle of Octo-
 ber, the Pompion together with the
 Stalk and Leaves weighed three pound
 wanting a quarter. And yet the Earth,
 being very well dry'd in an Oven, was
 found to have lost little or nothing of its

first

first weight. He try'd the like Experiment with two *Cucumbers*, which being taken out of the Earth wherein they had grown, weighed (together with the Roots and Branches) fourteen pound and six ounces; and yet the Earth had lost but a pound and a half of its first weight, which the Gardiner judg'd to have been in great part wasted in the ordering. But granting that some of the Earth, or rather of the dissoluble Salt harbour'd in it, was wasted in the nourishment of the *Plant*; yet 'tis plain, that the main Body of it consisted of transmuted Water. This Experiment may be try'd with the Seeds of any Plant that is bulky and grows hastily. Likewise *A top of Spearmint* of an inch long, being put into a vial full of Spring-water with its lower part immers'd, did in a few days shoot forth numerous Roots into the *Water*, (as if it had been Earth,) and display it self upwards into many Leaves, with a pretty thick stalk. The same Experiment has also succeeded with *Marjoram* (tho' more slowly) *Balm*, and *Peniroyal*, to name no more. One of these Vegetables cherish'd only by Spring-water, and that never renew'd, afforded by distillation (besides Phlegm) an Emphyreumatical Spirit, an adust Oyl, and a *Caput mortuum*

mortuum ; that appearing to be a Coal, consisted no doubt of Salt and Earth. And if *Helmont* had distill'd the foremention'd *Tree*, no doubt it would have afforded him the like distinct Substances as another of the same kind. But a more considerable Instance (to prove that all sorts of Bodies are nothing else but Water subdu'd by Seeds) than any yet mention'd, is afforded us by *Mr. de Rochas*, who tells us, that he took simple *Water*, that he well knew to be mix'd with no other thing but the Spirit of Life, and having with a heat Artificial, Continual, and Proportionate, prepar'd it by the Graduations of Coagulation, Congelation, and Fixation, which he had spoken of before, untill it was turn'd into *Earth* ; this *Earth* produc'd *Animals* that mov'd of themselves, *Vegetables* and *Minerals*. The *Animals* he found, by a Chymical Anatomy he made of them, to be compos'd of much Sulphur, little Mercury, and less Salt ; and the *Minerals* (which were solid and heavy, and began to grow, by converting into their own Nature one part of the *Earth* thereunto dispos'd) of much Salt, little Sulphur, and less Mercury. And tho the judicious *Mr. Boyle* has some suspicions of this strange Relation, yet as to the Generation

neration of Animals and Plants, he thinks it not incredible, since *common Water* (which is indeed often impregnated with variety of Seminal Principles and Rudiments) long kept will putrify and stink, and then perhaps too produce Moss and little Worms, or other Insects, according to the Nature of the Seeds that were lurking in it. And tho' the Distillation of *Eels* yielded him some Oyl, Spirit, Volatile Salt, and *Caput mortuum*, yet were all these so disproportionate to the Phlegm (in which at first *they* boyl'd as in a pot of Water) that *they* seem'd to have been nothing but Coagulated Phlegm; which does likewise strangely abound in *Vipers*, as hot in their operation and as vivacious as they are.

And *seven ounces and a half of Human Blood* yielded near *six ounces of Phlegm*, before any of the Spirits began to arise, and require the Receiver to be chang'd. *Corrosive Acid Spirits*, tho they seem to be nothing but Fluid Salts, yet you'l find them to *abound with Water*, if either you entangle, and so *fix their Saline part* by making them corrode some idoneous Body, or *mortify it* with a contrary Salt. Thus in making of *Balsamus Samech* with
distill'd

distill'd Vinegar instead of Spirit of Wine, the Salt of Tartar from which it is distill'd, will, by mortifying and retaining the Acid Salt, turn near twenty times its weight of the Vinegar into worthless Phlegm, before it be satiated. And in making the true *Balsamus Samech* (which is nothing but Salt of Tartar *dulcifi'd*, by distilling from it Spirit of Wine till it be glutted with the *Vinous Sulphur*,) as soon as the Spirit of Wine is depriv'd of its Sulphur by the Salt of Tartar, the rest (which is incomparably the greater part) remigrates into Phlegm: so that if *Helmont's* process be true (which was confirmed to Mr. Boyle by a sober and skillfull Spagyrist, who did indeed prepare the Spirit and Salt by a way that is neither short nor easie, but added nothing to them) Spirit of Wine seems to be *Materially nothing but Water under a Sulphureous disguise*, tho' being so igneous that it will totally flame away, 'tis of all Liquors the most likely to be free from Water. But *Helmont's* grand Argument for his *Hypothesis*, is taken from the operation of the *Alcabehest*; which, he says, does adequately resolve Plants, Animals, and Minerals into one Liquor or more, according to their several internal Dispar-
ties

ties of Parts, (without *Caput mortuum* or the destruction of their seminal vertues ;) and that the *Alcahest* being abstracted from these *Liquors* in the same weight and vertue wherewith it dissolv'd them, they may by frequent Cohobations from *Chalk* or some other fit substance, be totally depriv'd of their seminal Endowments, and by that means reduc'd to Insipid Water. Here *Mr. Boyle* judiciously observes, that it may be doubted whether this Water, because insipid, must be Elementary ; since the candid *P. Laurembergius* affirms that he saw an insipid *Menstruum*, that was a powerfull Dissolvent : and the Water which may be drawn from Quicksilver without addition, tho' almost tasteless, will manifest a very differing nature from simple Water, if you digest in it appropriated Minerals. However the forementioned Experiments concerning the growth of Vegetables, do sufficiently prove that Salt, Spirit, Earth, and Oyl (which are four of the pretended Chymical Principles) may be produc'd out of simple Water. But to return to our Author.]

Having prov'd, That *Water is the only Material Principle of Bodies usually call'd Mixt*, by three Arguments. 1. Because
none

none of the other pretended *Chymical Principles* have a right to that *Title* ; some of them not being naturally pre-existent in the Bodies from which they are obtain'd ; and *all* of them being reducible to Elementary Water. 2. Because *Water* is the only *Nourishment* of all *Animals*, *Plants*, and *Minerals* ; and by consequence the only *Matter* of which they consist. Because all *Animals*, *Plants*, and *Minerals* are by a true *Analysis* ultimately reducible to simple insipid *Water*. Having evinc'd this, I say, by these three newly mention'd Arguments ; and *Fire* being the only Sublunary Body (besides *Air*, of which hereafter) that these Arguments, as hitherto prosecuted, can with any colour of reason be pretended not to reach ; and *being* likewise by many enumerated amongst the Principles of Natural Bodies ; the next Proposition shall be, that

Prop:

Prop. XVI. *Fire is nothing but an Acid
Volatile Sulphur very swiftly mov'd.*

FOR there is a certain *Sulphur* in every Inflamable Body, which takes fire as soon as 'tis put into a rapid motion, whatsoever the Cause be that excites it to that motion. This appears in the striking of fire by the collision of two *Flints*; in the firing of the *Axel-tree* of a Mill or Coach, that sometimes happens upon a long continued and vehement attrition; and in many other such obvious Instances. *Oyl of Vitriol* contains a great many Acid Sulphureous Particles, proceeding as well from the Embryonated Acid, that Corroded the Iron or Copper Oar in the Bowels of the Earth, as from the Iron or Copper it self: these Particles, being excited to motion by the affusion of *Oyl of Tartar* (or even genuine Spirit of Tartar) produce a notable heat and Effervescency. The Sulphur of *Quick-lime* (whether it be innate, or adventitious from the fire) conceives a vehement Heat, as soon as 'tis excited to motion, by the Alcaline Lixivial Particles set at liberty by the affusion of Water. Finally (to add no more)

more) *Butter of Antimony* consists chiefly of the *Sulphureous Particles* of the *Antimony*, and the *Salino-Acid* ones of the *Mercury Sublimate*: the latter being wash'd off with Water, the former do more manifestly appear, (namely in *Mercurius vita*, which causes Vomiting without any danger of Corroding the Bowels:) and both of them being vehemently mov'd by the affusion of Spirit of Nitre, there is an intense heat produced.

So that the *Formal nature of Fire or Heat* consists in *Motion*. Now that the *Sulphureous Particles* of which *Fire* is materially constituted, are of an *Acid nature*, will abundantly appear from the ensuing Considerations.

I. The particles of the *Flame of common Sulphur*, being receiv'd and *Condens'd* in a Glass Bell, do compose a very piercing *Acid Liquor*.

II. There are not any Bodies more akin to *Fire*, than the totally inflammable *Spirits* of fermented Vegetables. And yet all the *Principal Effects* of these *Fermented Spirits*, depend upon a *Volatile Acid*. For 'Tis upon the account of its *Acid Salt*, that *Spirit of Wine* is *Coagulated* in *Spirit of Urine* or *Salarmoniac*, or in any other
Volatile

Volatile Alkali, as also, that it loses its strength by distillation from Salt of Tartar, which imbibes and retains the Acid, and receives an increase of weight thereby. And Generous Wine, that is turgent with this Spirit, being drunk moderately, sends a Volatile Acid to the Brain, that makes a subtile effervescence with the (Alcaline) Animal Spirits, and thereby produces Cheerfulness and a Vigorous Promptitude to Action; (as on the contrary, the Sadness of Melancholy persons proceeds from the Fixation of the Animal Spirits by a more Fixt Acid.) But upon excessive Drinking, that *Volatile Acid* ascends too copiously to the Brain, conquers and fixes the Animal Spirits, and so stupefies the Organs of Sense and Motion: yea sometimes it may Suppress the Vital Acid (or Innate Heat) of the Blood, and at length totally Coagulate it; especially if the Wine be endow'd with a strong Acid, as the *French*, and chiefly the *Hungarian* Wines are wont to be. And indeed, that the *Inebriating* vertue of Wine (and all other strong Drinks) is entirely owing to a *Volatile Acid*, may be prov'd by many Arguments. 1. Hence 'tis, that *Volatile Alcaline Salts* do prevent Drunkenness, especially Spirit of Salt-Ar-

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moniac, if some drops of it be now and then mingled with the Drink. 2. *Bitter Almonds* and other *Oleous things*, do likewise prevent Drunkenness, by weakning and *suppressing the vaporous Acid* of the Wine, so that it cannot reach the Brain. 3. The same Acid inflames Drunkards Faces, and adorns them with purulent Pimples, like so many Gems. For the whitish colour'd Matter, contain'd in these Pimples, proceeds only from the Volatile Acid of the Wine that infects the ferment of the Muscles of the Face, coagulates and precipitates the *Blood* that comes thither for Nutrition, and so changes its Purple Colour into a whitish one. For proof of this Assertion, 'tis to be noted, that the Purple Colour of the Blood proceeds from the resolution of the Sulphurous Acid Parts by the ferment of the Heart, which sets them at liberty, so as that they may mix *per minima*, and make a subtile effervescence with the Alcaline Spirits: as when Spirit of Salt-Armoniack or of Harts-horn, or any other that is Alcalical, is digested with Spirit of Wine, they produce together a very red Tincture, because the Acid Sulphur of the Wine, being by Digestion intimately mix'd, and making a subtile effervescence with the subtil Alcaly,

is at length so resolv'd as to manifest it self by tinging the whole Liquor: after the same manner, in the Tincture of the Salt of Tartar, the Spirit of Wine is *ting'd* by the Volatilis'd Alcaly of Tartar: and common Sulphur boyl'd in the *Lixivium* of any Fixt Salt, is thereby exalted to a Red Colour; but because the Alcaline Salt is so ty'd to the Terrestrial Particles, that it cannot penetrate the Sulphur *per minima*, therefore the Colour is obscure and dark. Now, if you pour another Acid Liquor upon these Sanguine Tinctures, immediately they become of a Milk-white Colour. Just so it happens, when the Blood is extravasated, and putresc'd in any Part of the Body, the Acidity, that arises from this Putrefaction, Precipitates the Sulphur that ting'd the Blood, and thereby turns it into white stinking *Pus*; even as common Sulphur, when it is Precipitated out of any *Lixivium* by the affusion of Vinegar, strikes the Nose with an ungratefull Odour, tho it was utterly inodorous before: so that *Pus* is nothing but Blood, whose vital Alcaline Balsamical Spirits are suppress'd by an hostile Acid, and the tinging Sulphureous Particles Precipitated in Wounds & Abscesses, while the *Pus* is a making, the motion of

the Acid Particles do often produce a Symptomical Feaver, an Inflammation in the Part affected, Convulsive Motions in the Brain, and Pains in the Nervous Parts: but these Symptoms abate, as soon as the *Pus* is made, and the motion of the Particles ceas'd. 4. Amongst the External Medicins, that are wont to be apply'd to the foremention'd *Pimples* in the Face, the *Preparations of Saturn* are the chief; because they imbibe the Acid of the Wine, or other Inebriating Liquor, that inflames the Face. For *Saturn* readily receives all sorts of *Acids* or *Sulphurs*, even those of Metals, as is well known to the Refiners. Thus the unripe *Sulphurs of Metals*, Coagulated in *Saturn*, do compose *Litharge*. *Vinegar*, Coagulated in *Saturn*, produces *Sugar of Lead*. And all *Acids* in general, Coagulated in *Saturn*, *Mars*, or any other *Body* whatsoever, are wont to be dulcify'd thereby. For all *Sugars* are nothing but *Acid Salts Coagulated in other Particles*: whence 'tis, that they are resolv'd by Distillation into a very *Ardent* and powerfully *Inebriating Spirit*; and are extream fit to promote or even begin *Fermentations*: and therefore 'tis, that the *Syrups* of the Shops have a manifestly *Acid* Taste; and *Sugar* is very hurtful to *Scorbutical* persons, because

because upon the account of its Acidity it excites divers vitious *Effervescencies*, produces Tumors of the Bowels &c. And vitiates the Vital Ferment of the Stomach.

III. That the Particles of Fire are of an *Acid* Nature, may evidently appear from all other *Inflammable Substances*, especially those that are *Oily* and *Fat*, as well as from common *Sulphur* and *Spirit of Wine*.

For in the first place, 'tis certain, that *Oleous* and *Fat Bodies* are really endow'd with an *Acid*; as appears from the following Reasons. 1. Chirurgions observe, that Oyls, and fat Substances, are very *noxious* to the *Bones*, (especially the *Skull*, which is a Porous Bone) and particularly, that they are apt to make them *Carious*; which must happen upon the account of their Corroding Acid. And for the same reason, they render *Ulcers* *sordid*, by increasing the Corroding Acid.

2. What else is that Greenness, that adheres to Lamps, but the Acid of the Oyl-Olive Coagulated in the Particles of the Metal, that it has Corroded? whence comes the *Blew* Colour of *Oyl of Camomil* distill'd in *Copper* Vessels, but from some Particles of the *Veins* Corroded by

the Acidity of the Oyle ? 3. The *Heart-burn* (*Ardor Ventriculi*) is often occasion'd by Fat things, (especially if you drink after them, because the Acid Salts are thereby dissolv'd and put into a swifter motion) as well as by austere and sourish Wines : and the Remedy, in both Cases, is, to use things fitted to Precipitate the Acid. 4. Oleous and Fat things are hurtful in *Erysipelatous* Distempers, (which proceed from the Coagulation of the Blood by an Acid,) because they increase the Peccant Acidity, whence the Putrefaction is increas'd, the Bones are corroded, and the Natural Heat of the Part is at last totally suppress'd, and mortify'd. (Yet the Author denies not, but these Effects do also partly depend upon the *Obstruction* of the Pores of the Part, by the fore-said Fat substances, so that the *Effluvia*, wont to transpire through the Pores, being detain'd in the Body, and inordinately mov'd, do increase the Feaver.) 5. 'Tis likewise upon the account of their Acidity, that Oyls are hurtful to all *Inflammations*, without such a Preparation as consumes or corrects their Acid. Thus *Lin-seed Oyle* mingl'd with an equal weight of *Spirit of Wine*, and boyl'd (with continual stirring) till the Spirit

be

be consum'd , is us'd safely and successfully, both inwardly and outwardly, in *Pleurisies, Peripneumonies, Inflammations of the Liver* &c. because the Coagulating Acid is readily imbib'd by this Oyl, that has been depriv'd of its own Acid by the Spirit of Wine, which, being a much more Volatile Oleous Body than the *Oyle of Lin-seed*, evaporates before it, and carries its Acid along with it; even as the same Spirit, being mingl'd with *Aqua fortis* and distill'd in a Cucurbit, ascends before it, and carries a great part of its Acidity along with it, insomuch that the remaining *Aqua fortis* becomes a very safe Internal Medicine, tho' before, the smell of it only would cause an *Atrophia* in the whole Body. The same Oyl of Lin-seed is also Corrected, by frequently extinguishing red hot *Steel* in it, till it appear by the ceasing of the hissing & smoke, that the Acid Particles are either Evaporated in smoke and spent by Deflagration, or Coagulated in the *Mars*. And if after this it be Distill'd from *Quick-lime*, that if any Acidity yet remains, it may be therein Coagulated, the *Oyl of Lin-seed* becomes an excellent Remedy for Inflammations, Burns and the like: as *Oyl-Olive* also does, by Distillation from *Quick-lime*.

And this last nam'd Oyl, being *imbib'd* in old *Tyles* or *Bricks* (which are depriv'd of all moisture by their having been long expos'd to the heat of the Sun) heated red hot, and quench'd in it, and then *distill'd* in a Retort, is thereby robb'd of all its Acidity, and acquires a singular Vertue in the *Palsey*, *Gout*, *Cramp* &c. And all Oyls are wholsomer boyl'd than crude, because a great part of the Acid is exhal'd in the boyling. 6. *Helmont* teaches that *Distill'd Chymical Oyls*, which are otherwise very hot, may by an artificial *Circulation* for three Months time with an *Alkali Salt* be turn'd into a very *temperate Volatile Salt*: namely because the hot Acid of the Oyl is Saturated by the Alkali, and by that means reduc'd temperate. Nor can there be any other Reason given, why the Alcaly should have this effect upon the Oyl, but that the Acid of the Oyl corrodes the Alcaly and is Coagulated in it.

Now in the next place, That the Heat and Inflammability of Oily Substances depend upon the Acid, that the Experiments, newly deliver'd, prove to be contain'd in them, may be evinc'd from those same Experiments; most of which do not only prove, that *Oleous and Fat Bodies* are endow'd

dow'd with an *Acid*, but likewise, that the effects usually ascrib'd to the hot Quality of these Bodies, do indeed depend upon this *Acid*; and that whatsoever mitigates or destroys this *Acid*, does at the same time weaken or destroy their *Heating Power*. And 2. that this may also be truly apply'd to their *Inflammability*, and that the *Acid Particles* contain'd in *Oyle and Fat Substances* are really the *Matter* of which the *Flame* of these Substances (when they are burning) consists, does plainly appear by the *Abstraction* of Oyles from *Spirit of Wine, Quick-lime, or Bricks*; for, being by this means depriv'd of their *Acid*, they become less *Inflammable* than the crude Oyles were. And Candles made of *Sheeps Tallow*, burn sooner away than those made of any other *Tallow*, because there is greater store of *Acid Particles* in it; as appears by the *Griping of the Guts*, which cannot happen without a *Corroding Acid*, (for all the Medicines, effectual against this Distemper testify that to be the Cause of it) and which is very often occasion'd by eating *Fat Mutton*, especially if the *Acid Salts* be dissolv'd by drinking after it, in like manner as when *Salt Butter* is sweetned by melting it, and pouring it into water,

and

and thereby dissolving the Salt. Likewise recent Fat, or Oyl burns sooner away, than that which has been long kept, and thereby lost much of its Volatile Acid. *N.B.* Since Tallow, as well as every other Body, is materially nothing else but water Coagulated by a feminal Acid, and since 'tis only the *Acid Particles* that feed the Flame; it follows, that when they are consum'd, the remainder, being robb'd of, the Coagulating, Acid must return into Elementary Water, and therefore 'tis insensibly dissipated like a Vapour: even as the water of Spirit of Wine kindled vanishes into a Vapour.

IV. The Particles of Fire being fix'd or Coagulated in any Body whatsoever, do plainly manifest themselves to be Acid, as appears from the following Instances.

1. *Fire Coagulated in Mars*, turns it into a *Crocus*, that differs nothing from Rust, (which proceeds always from an Acid) and is every way like to that *Crocus* which is prepar'd with Acids, and endow'd with the same Medicinal Vertues. *V. Tachen. Hipp. Chym. cap. 28.* 2. *Fire Coagulated in Saturn* is separated by means of a Fixt *Alcaly*, or even of *Venetian Borax*; for *Minium* (which receiv'd its red Colour from the Sulphur of the Coals, even as the Sulphur

phur of Antimony Coagulated in Mercury, turns it [into Cinnabar] of an exceeding high red, is by the help of these Salts reduc'd to crude Lead. *N.B.* According to Tachenius's Computation, 100 pound of Lead retains in Calcination ten pound of Fire. 3. All the Remedies for Burns are such as are capable to imbibe, saturate, or suppress the Igneous Acid; for instance, Sugar of Saturn, Cerniss, Litharge, Oyls depriv'd of their Acidity, Lixiviums, &c. And unwashen Threed mitigates Erysipelatous Inflammations, because of the Alcaly of the Spittle.

V. And lastly, The Acidity of the Particles of Fire appears from its efficacy in Chirurgery, and particularly in extirpating ill condition'd Ulcers. For the cause of Ulcers being a Corrosive Acid, they may be cur'd by three sorts of external Medicines. 1. Those that Saturate this Acid, as Spirit of Salt-Armoniac, Quick-lime Water, Oyl of Tartar per deliquium, and the like. 2. Those that imbibe and assume this Acid, as all the Preparations of Saturn. The Author has known Ulcers in the Legs cur'd, meerly by applying thin Plates of Lead to them; because the Acid, corroding the Musculous Flesh, was coagulated in the Lead. 3. Those that by a more potent

tent Acidity *suppress* this weak one; as *Verdegreefe*, which consists of the Acid Salts of Vinegar Coagulated in Particles of *Venus*; now these Salts are much more powerfull than in common Vinegar, because they are concentrated and separated from strong Phlegm, and thereby enabl'd to suppress the weaker putredinous Acid of the Ulcers; which *Aqua fortis*, *Spirit of Salt*, and other Acid Spirits also do. But nothing performs this so effectually, as *Actual Cauteries*, because *there is no Acid so powerful as that of Fire*.

N. B. 1. The *Acid Effluvia*, that are continually passing away from Inflammable Bodies while they are burning, do compose *Flame*, so long as *they* continue numerous enough within a certain Sphere, and in a very swift motion, but having pass'd the limits of this Sphere, *they* begin to move more slowly, and are by degrees dispers'd. So that the same *Acid Effluvia*, which being in a rapid motion, produce tormenting Pains and Convulsive Motions by corroding the Nervous Parts; when they are in a moderate Motion, do produce in our Body a temperate and gratefull heat, by inciting the Nervous Capillaments to gentle Spasms.

N. B. 2. Tho' Actual Fire be so far from

from being one of the Material Principles of Mixt Bodies, that *it* cannot exist in them without destroying them; yet there are certain *Acid Particles* in all mixt Bodies, differing but in Rest, or in Degrees of Motion from Actual Fire, in *which the Seeds or Ideas* reside, that are the *Formal Principles* of those Bodies. But these Acid Particles do themselves return into *Elementary Water*, when they are devested of those Seeds. Which *Seeds or Ideas*, so often heretofore mention'd, t'will now be seasonable to explain.

Having abundantly prov'd, that *Simple Water is the only Matter of which all Mixt Bodies consist*, 'tis plain that they all agree in one and the same *Material Principle*; so that their difference one from another proceeds not from any diversity in the Matter of which they consist, or in the proportion of the Elements that may be suppos'd to concur to *their Composition*. But,

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Prop. XVII. *The diversity, that is among Natural Bodies, is wholly owing to the different Seminal Ideas, that regulate the Operation of the Plastick Spirit, which Coagulates Water into various Substances, differing in Figure, Solidity, Bigness, Order and Connection of Parts, and other Modifications, according as its Motions are guided by these Ideas.*

FOR when God at first Created out of nothing the *Terraqueous Globe*, and furnish'd it with numerous Bodies of several *Species* or kinds; he was pleas'd, because the Individuals were Corruptible, to endow them by vertue of his Omnipotent Word (*Be fruitful and multiply,*) with a Power of producing out of Pre-existent Matter, new Individuals like themselves, and of their own *Species*; that so, when the first Individuals were dissolv'd, the *Species* might nevertheless be preserv'd in these new Individuals generated by the first; & so on, as long as the world endures. *This Generative Power is seated in the seeds; [which are very obvious in Animals and Vegetables, but more doubtful in Minerals, at least in severall sorts of them.]*

As for *Animals*, and particularly *Man*;
the

the *Feminine seed* is a limpid Liquor, contain'd in the little *Eggs*, that are found in the *Testicles*. This *Seminal Liquor* contains in it self an exact *Idea* of an entire Human Body (of the femal sexe,) consisting of as many particular distinct *Ideas*, as there are different Parts in a Human Body, which all together concur to make up one entire *Idea* of an entire Woman: so if it were possible for us to contemplate this *Idea* with our *Bodily Eyes*, as well as we can do with our *Intellectual*, we might discern in it sensible signatures of all the Parts of the Body, alltogether making up a lively representation, and as 'twere exact *Model*, of an entire Woman. The *Idea* of every particular Part in this Seed, is a Particle of the *Idea* that resides in that same part of the *Womans Body* that generates this Seed. For every Part of a *Womans* (*Mans*, or any other *Animals*) Body, whether *Similar* or *Organical*, has its own *Idea* residing in it, in which *Idea* is imprinted upon, or (which is all one) communicates a Particle of it self unto the *Blood*, that Circulates through the Part; and the *Blood* carries all these *Ideas* to the *Testicles*, where they are gather'd together, dispos'd into the same Order that the Parts, they come from, have in the

Womans

Womans Body, and so united into one entire *Idea*, which is inclos'd within the Tunicles of the *Egg*, that being defended from Injuries thereby, the particular Parts of it may be able to retain their due situation, and may not be lyable to be confounded one with another or misplac'd. This *Idea* is endow'd in the *Testicles* with a particle of that moving *Vital Spirit*, which is the Principle of all Vital Actions, and the only Mover of all Seeds, which, without this, are Barren and Unfruitful, because they cannot unfold themselves. But yet this *Plastick Spirit* in the *Feminine Seed* is too weak for to accomplish the evolution of the *Ideas*, without it be *strengthen'd*, Actuated, and Fecundated by that more powerfull *Spirit* which the *Masculine Seed* is impregnated with. All that has been said of the *Feminine Seed*, is applicable also to *this*, saving, that it contains *Ideas* of all the Parts of a Human Body of the *Male Sex* only, not of the *Female*; and that these *Ideas* are confounded one with another, because the Seed not being inclos'd in Tunicles in the form of *Eggs*, but contain'd in the *Testicles* in a liquid form, they fluctuate and cannot retain any certain Order. Hence it is, that as the

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ment into a substance agreeable to the particular *Ideas*, and applying it to them: by which means the *Ideas*, that were utterly insensible before, do quickly acquire a visible bulk: insomuch that *Kerkringius* tells us of a *Fœtus*, but four days old, wherein the distinction of the Parts was plainly discernible. This Apposition of Aliments to, and gradual Evolution of the *Ideas*, begins at the first Conception, and continues after the Child has left the Womb, till the Body have attain'd its full stature; (that is, to a perfect Evolution of the *Ideas*, for when the *Ideas* are not capable of any further Evolution, the Growth of the Body must cease.) So that *Generation* is really nothing else, but the first *Nutrition*; or the Apposition of Aliment to and Evolution of the *Ideas* while they are yet insensible: and on the other side, *Nutrition* is nothing but a continued *Generation*. For 'tis the same *Plastick Spirit*, guided by the same *Ideas*, that Coagulates and Applies the Aliment to every Part, both in and out of the Womb. And the immediate Aliment of all the Parts in both states is the same, namely *Blood*, but with this Difference, that the *Embryo* is nourish'd with the *Mother's Blood*, communicated to it by the *Umbilical Vein*
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from the *Placenta Uterina*: whereas, after the Child is born, it takes in various *Aliments* by the *Mouth*, and makes *Blood* of them it self for its own Nourishment. This *Blood* is already determin'd to nourish the *Human* (and no other Animals) *Body*, by the Impression that the *Idea* of the *Stomachal Ferment* has seal'd the *Aliments*, it is made of, with; but is *indifferent* to all the *Parts* of the *Human Body*, till it come to be determin'd to the Nourishment of particular *Parts* by being stamp'd (as it were) with the Seal of the particular *Ideas* residing in them. For every *Organ* hides in its Ventricle an *Idea* of its own *Body*, that regulates the Apposition of the *Aliment* to that *Part*, (and is the same that regulated the first Formation of it.) And the *Native Heat*, or *vital Spirit* of every different *Part*, Coagulates the *Blood* into a differing Substance, and applies it in a differing manner, according to the diversity of that *Idea*, which guides the Motions of this *Coagulating Spirit*. These *Ideas* were created with the *Parts* of the first Individuals. And after what has been said, 'twill not be difficult to conceive, how they were folded up (as it were) and united into one entire *Idea* in the Seed of these

first Individuals: *how* the *second* were generated by the gradual unfolding again of the same *Ideas*, & appolition of Aliment to them: in a word, *how* by the convolutions and Evolutions, (so to speak) of those *Ideas*, the Propagation of Mankind has been continu'd to this day. (And the same is to be said of all other Animals, as well as of all Vegetables.)

[This is as brief and clear an *Account*, as I could give of the Authors Notion of the Generation of Animals: *which* tho' it may seem already more prolix than is agreeable to the Design of this Treatise, yet, because the Theory of Generation is so difficult, and because I have not elsewhere met with so intelligible an Account of the *Seeds* and *Ideas* that *Helmont* so often speaks of; I thought it would not be foreign to my Design, if I insist a little longer upon a Theory, that will so much conduce to facilitate the Reading of an Author; that many are deterr'd from, by the Obscurity of his Notions, and that has deliver'd so many and so considerable *Chymical Experiments*; for the obscure hints he gives of some of the *Principal*, will be much better understood by one that is acquainted with His Notions, than by one that *is not*, *ceteris paribus*. Wherefore I shall

shall proceed, without any farther Apology, to deduce, from the *Hypothesis*, already deliver'd, an explication of some of the chief *Phænomena* of Generation; continuing to insist upon one single Instance, taken from the chief *Species* of Animals, *Man*: for the same things, that are here deliver'd concerning Man, may, with a little alteration, be easily apply'd to other Animals.]

The *Sexe* of the *Fœtus* is determin'd by the prevalency of the *Ideas* of the Fathers, or of those of the Mothers Seed. If there be a parity of both, the *Fœtus* will partake of both Sexes.

A *Mole* happens, when an *Egg* falls out of the *Ovarium* into the Womb, merely by the irritation of *Lust*, without congress with a Man: for the Tunicles of this *Egg* swell and are extended in the Womb; but the moving Spirit of the Masculine Seed is wanting, to unfold the *Ideas* of the *Egg* and apply Aliment to them: for the *Ideas*, tho' they give the due Figure to every Part, yet they cannot unfold themselves; and the *Feminine Spirit* in the *Egg* is not vigorous enough to do it; tho' it have really some activity, whereby it concurs with the *Masculine* in the formation of a true *Fœtus*, and makes itself alone some unperfect evolution of the *Ideas* in a

Mole, which has been observ'd sometimes by *Kerkringius* and others, to contain the Parts of a Human Body sensibly, tho' imperfectly, delineated. 'Tis because of this strength and vigour of the Spirit of Mens Seed, that they are said to be of a hotter temperament than Women; and that Eunuchs turn Effeminate in their voice, manners, and disposition.

Abortion happens upon the lest manifest *Acidity* of the Aliment of the *Fœtus*, for this Coagulates and suffocates the Spirit, that by its occult and milder *Acidity* should Coagulate the Aliment, and apply it to the Nourishment of the *Fœtus*. Hence a sour Scorbutick disposition of the Blood makes Women subject to miscarry; and the use of red Coral, Mother of Pearl, and the like is good to prevent it.

The *Plurality* of *Fœtus's* happens when more Eggs than one are *fœcundated* by the Mans Seed, and fall out of the *Ovarium* into the Womb. For the *Ideas* of the Mans Seed, being to be reduc'd into order by application to those of the Womans, every particular *Idea* may be divided, and apply it self to the correspondent *Idea* of several Eggs. This is manifest in the Seed of a Cock, which if the Hen have but once receiv'd, it suffices
often-

oftentimes to make her Eggs fruitful for a whole year thereafter. So that every particular *Idea* of his Seed, must have been divided into as many Particles, as there were Eggs *fœcundated* by it. *Marcus Marci, De Ideis operatricibus*, ascribes the plurality of *Fœtus's* to the *Plurality of Hearts* in the Seed, howsoever this be occasion'd; for the *Heart* being the *Center of Evolution*, as many *Hearts* as there are, so many *Centers of Evolution*, and by consequence so many *Fœtus's*.

The monstrous *Plurality of Parts* in one *Fœtus* happens, when the *Ideas of the Masculine Seed* are not exactly apply'd to the correspondent *Ideas of the Feminine Seed*; but decline to the right or left hand; so that, being separately unfolded, they make up distinct Parts.

The want of a particular Part (as Arms, Legs &c.) happens, when the *Idea* of that Part is not unfolded for want of Aliment; or is extinguish'd by some impure Acid Particles of the Aliment, or by the force of the Mothers Imagination of some person presented to her, that has (by an Accident perhaps,) lost that Part.

A *Pygme* or *Dwarf-Statue* happens, when the Evolution of the *Ideas* is hinder'd, either by the impurity or manifest

Acidity of the Aliment apply'd to *them*, some time after the *Fœtus* has left the Womb; or by the force of an *Idea* imprinted in the Mothers Imagination, that so mingles it self and becomes one with the *Idea*, that forms the *Fœtus*, as to determine it, not only in respect of Figure but of Stature; so that the *Formative Idea*, being straitly ty'd with the *Imaginative*, is compell'd thereby to stop before a perfect Evolution. If this *Idea* take root in one Subject, it may be propagated to Posterity, till it be extinguish'd by a supervening *Idea* of greater Force.

On the contrary, a *Gigantine Stature* proceeds from the Evolution of the *Formative Idea* beyond its due bounds; which *Marcus Marci* ascribes to two Causes, namely, either the *Refraction of the Ideal Rayes* by falling into a dissimilar *Medium*, or the *Mothers* strong *Imagination* of some huge Statue. And indeed there are many obvious Instances, to prove, that a *strong Imaginative Idea of the Mothers*, impress'd upon the *Seed*, (or even upon the *Embryo*, after the Evolution is begun) may have powerful Effects in the Formation of the *Fœtus*. For hence it is, that we can often distinguish Men of several Nations by their Aspect; because the Women of every Nation

Nation form in their *Imagination* so strong an *Idea*, from the constant sight of their owne *Country-men*, as, by uniting it self to the *Formative Idea*, determines it to fashion the *Fœtus* like *them*, in some Propertyes of the Countenance, that most, if not all, of *them*, agree in : *Jacobs Rods* also are a signal Instance to this purpose. And there are many *Relations* of *White Women*, that by reason of a strong *Imaginative Idea*, occasion'd by the frequent, or unexpected and affrighting sight of *Blackamores*, have brought forth black Children. This *Imaginative Idea* continues, till it be extinguish'd by the accession of another more powerfull *Idea*. The Author tells us of a Woman with Child, affrighted at the sudden coming of a *Blackamore*; who being presently wash'd all over, by the prudent advice of a By-stander, did so strongly imagine the washing off of the Blackness hereby, that the *Idea* of Blackness, formerly conceiv'd, and already imprint-ed upon the *Fœtus*, was by this means extinguish'd; for she brought forth a white Child, but spotted between the Fingers and Toes, and in a few other Parts that the washers hand had miss'd. Finally, to add no more, 'tis a very usual Observati-on, that if a Woman with Child conceive

a strong *Idea* of any Thing, whether by a longing desire after it, or being affrighted at the sight of it &c. the Child seldom fails to have a Mark in some part of its Body, representing that thing both in Colour and Figure; whether it be a *Cherry*, *Mouse*, or any other such like thing: and if the Thing, that surprises the Mother, fall upon or hit against a particular Part, the *Idea* of it will be impress'd upon that same Part of the *Fœtus*. [An Eye-witness related to me, that a pregnant Woman, that had been affrighted with a *Cat* suddenly thrown upon her lap, brought forth a Child with two Marks, one above each Knee; which Marks, when the Knees were brought together (into the same posture that the Mothers were in, when the *Cat* affrighted her) did exactly represent an entire *Cat*, with the Head above the one Knee, and the Tail above the other, in the very same posture that the *Cat* fell in. But, tho' it plainly appears from these and many more such Instances, that the Mothers Imagination has a powerfull influence upon the *Fœtus*; yet to give a clear and intelligible Explanation of the Manner how it produces such Effects, is a matter of no small difficulty; and our Author gives but little account

count of it. However I shall offer some Considerations, that may somewhat lessen this Difficulty, tho' I shall not pretend to give a clear and satisfactory Solution of it. First of all then, I consider, that, since the *Formation of the Fœtus* is wholly regulated by the *Seminal Ideas*, 'tis easy enough to conceive, that an *Imaginative Idea*, impress'd upon the Seed, may have a considerable Influence in the Formation of the *Fœtus*. For Instance, the *Idea* of a *Blackamore* (simply as such, regarding only the Colour of his skin, and not the figure, proportion, and other *Qualities* of the Parts of his Body ; or at least, not being so strong in regard of them, but that other different, and more prevalent *Ideas* of these *Qualities*, may render this ineffectual, as to *them* : this *Idea* (I say,) impress'd upon the Seed, may determine the *Formative Spirit* to form the *Fœtus* with a black skin ; since it has been formerly prov'd, that all the Modifications (and consequently the Colour) of every Part, depend intirely upon the *Ideas* residing in the Seed. In the next place I consider, that, since 'tis highly probable, that the Animal Spirits, which come from the Brain through certain little Nerves to the *Testes*, do there mingle themselves with

with the spirituous part of the *Blood*, brought thither by the Arteries, and concur with it to make up the Matter whereof the Seed consists: and since the *Idea* of a *Blackamore* (to keep to the former Instance) is convey'd to the Brain and imprinted there by the Animal Spirits, which receive it from the *Image* or *Idea* painted in the bottom of the Eye, upon the *Tunica Retina* or (as others think) the *Chorooides*, by the Rayes of Light reflected from the *Blackamores* Body; it may be easily enough conceiv'd, that the Animal Spirits may also convey the same *Idea* from the Brain to the *Testes*, and there impress it upon the Seed. For if the Animal Spirits of the *Optick Nerves* transmit this *Idea* from the Eyes to the Brain, and there imprint it; why may not the Animal Spirits of the *Par vagum* transmit the same *Idea* from the Brain (through certain little Branches that reach,) to the *Testes*, and there communicate it to the Seed. And since the *Rayes of Light*, that come from the Object, may be Reflected from a *Specular Body* to the Eye, without losing thereby that Figuration, Motion, or whatever other *Modification* it be, that qualifies them to paint an exact *Idea* of the Object, they receiv'd it from, upon the
Retina

Retina or Choroeides: why may not the *Animal Spirits*, that receive the very same *Modification* from the *Tunicle of the Eye*, be *Reflected from the Brain to the Testes*, and there *impress the same Idea upon the Seed*. Nor can it be said, that the *Seed* is not a *Subject capable of such Ideas*, since (as was noted before) the *Animal Spirits are Part of the Matter* whereof it consists, so that by taking them into its own substance, it must receive the *Ideas* they bring along with them. And 'tis most certain, that many Impressions, made in particular *Parts of the Body*, and transmitted to the *Brain*, do not stop there, but are *Reflected back to the same*, or to other *Parts*, where they often produce very notable Effects; & that barely by the strength of the *Impression*, without any concurrence of the *Wills Determination*, yea many times in direct opposition to it. And tho' the *Substance of the Brain* seems very remote from being *Specular*; yet since that *Quality* depends upon such a *Modification of the surface of any Opaque Body*, as qualifies it to *Reflect the Rayes of Light* in the same order they fell in, without at all confounding them, or altering the *Modifications* they receiv'd from the *Object*; 'tis plain that
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the *Brain*, if it be at all capable of *Reflecting the Impressions* that come from *visible Objects*, (as certainly it is) must, as well as *Specular Bodies*, tho' perhaps upon very different accounts, be qualify'd to *Reflect* them *without confounding or altering them*; for if the *Brain* should confound or alter them, there could be no true distinct *Ideas* of the *Objects*, they come from, form'd in it.

All these Considerations may be also apply'd, to lessen our wonder at the powerful *Influence of the Mothers Imagination upon the Fœtus in the Womb* already form'd. For so long as the *Fœtus* is in the *Womb*, it may very justly be consider'd as a *Part of the Mothers Body*; since her *Blood Circulates* through and nourishes it, as well as the other *Parts of Her Body*. And being 'tis very probable, that the *Animal Spirits*, convey'd by the *Nerves* to every *Part of the Mothers Body*, do there mingle with the *Blood* brought thither by the *Arteries*, and concur with it to the *Nutrition* of the *Part*: I may very reasonably suppose, that the *Animal Spirits*, that come to the *Womb*, may there mingle with the *Arterial Blood*, and be transmitted together with it by the *Umbilical Vein* into the *Body of the Fœtus* for its

its *Nourishment*. And if there be a *strong Impression* of any *Idea in the Brain*, the *Animal Spirits* may (as was formerly explain'd with relation to the *Testes*) convey it to the *Womb*, and there *impress* it upon the Body of the *Fœtus*; which, being so soft and *tender*, may upon that account be more susceptible of any such Impression, than the other Parts of the Mothers Body; especially since Her frequent and solicitous Thoughts of the *Womb*, and the *Fœtus* therein contain'd, may determine the *Animal Spirits* to flow more copiously thither than to other Parts, and keep those Pores of the Brain that lead thither more open: so that the Reflection of any Impression, made upon the Brain, may have a freer course that, than any other way. And tho' the *Impression* made upon the *Fœtus* be but weak at first, yet it may be afterwards sufficiently *confirm'd* by often *reiterated Imaginations*. Finally, tho' it be very little at first, yet it may increase daily as the *Fœtus* grows: which may be both illustrated and confirm'd by Figures lightly cut in the Rind of a *Gourd*, which grow bigger and bigger as the *Gourd* increases.

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And now I see not any considerable Difficulty remaining in this Subject, after I shall have added this one Consideration ; namely, That, because the *Formative Idea*, residing in every Part of the *Fœtus*, is a Particle of the *Idea* that resides in the same Part of the *Mother's Body* ; an *Imaginative Idea*, produc'd in her Brain, by a sudden Impression made upon any Part of her Body, may, when it is communicated to the *Fœtus*, be more apt to unite it self with the *Formative Idea*, belonging to that same Part of the *Fœtus*, than with any other ; and upon this account, that Part may more easily, than any other, receive the Impression. For the *Idea of the Object* comes to the *Mother's Brain*, accompany'd with the *Idea of the Part*, that the Impression is made upon, and the *Imagination connects* them together as it were into one *Compound Idea*, and transmits them to the *Fœtus* ; where the latter easily unites it self with the *Formative Idea* homogeneous to it, and the former impresses itself upon the Part, that this *Idea* resides in.

If it be objected, that after all that has been said, we are still in the dark about
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the main Point, for want of a clear and distinct Notion of the *Ideas* so often mention'd. I answer, that many things have been already, and some more yet remain to be, deliver'd, tending to clear the Nature of those *Ideas*, all which laid together, and attentively consider'd, may go a great way in assisting judicious Readers, to form as clear Notions about them, as can well be expected in so abstruse a Subject, as the *Generation of Animals*. And 'tis no less eefficult, if not much more, to give an Intelligible and satisfactory explication, of the Nature of *Imaginative Ideas*, representing sensible Objects in the Brain (which no man questions the reality of,) than of those *Formative Ideas*, that the Notions, here propos'd about Generation, are built upon. And he that denyes the *later*, because he cannot be distinct enough in his Conceptions of them, may upon the same ground deny the *former*, yea and even disbelieve his own Eyes, when he sees the *Ideas* of many various Objects transmitted through a small hole (fill'd with a Convex Glass) into a dark Room, and there delineated to the life, without the least confusion, upon a piece of White Paper, plac'd opposite to the hole, at a convenient

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distance. And such a Person I cannot better answer, than by recommending to his serious Perusal, *A Discourse of things above Reason*, lately Published; where the acute and judicious Author very convincingly proves, that, 'tis highly reasonable to believe many things, that our Reason cannot comprehend; many that we cannot form any clear and distinct Notions of; and many that we cannot reconcile to other unquestionable Truths. For the *Ideas*, we have been speaking of, may very justly claim a place in the second of the three, newly mention'd, Ranks of *Priviledg'd Things*, which that Author styles *Inexplicable*. 'Tis true, that profound and subtil Philosopher, *Des Cartes*, has attempted, in his Book *de Homine*, to give a Mechanical Account of the *Ideas*, that are imprinted in the Brain by insensible Objects. But he founds his Notions upon an *Hypothesis*, concerning the Structure of the *Brain*, and the Motion of the Spirits in it, which tho' it be most ingeniously devis'd, yet 'tis so far from being countenanc'd by *Anatomical Observations*, that it seems utterly inconsistent with the *best* and most *accurate*, that have been made upon that *Part*. But 'tis more than time to conclude this Digression, and proceed to the rest of our Authors Obser-

Observations about the Seminal Ideas of Animals, and particularly of Man.

The *Propagation of Hereditary Distempers* (such as the Epileplie, Gout, Stone, Consumption) from Parents to their Children, depends upon this : That the seminal *Idea* which forms the Lungs (for instance) of the *Fœtus*, is a Particle of that *Idea* which resided in the Parents Lungs : Which is to be understood also of the Reins, Joynts, Brain, and all the other Parts of the Body. Hence many Children are born with *Moles*, or Spots, in the very same Parts of their Body where their Parents had them, and of the same shape ; insomuch, that whole Families have taken their Names from the Things that the *Moles*, common to these Families, were observ'd to resemble, as the *Cicerones*, *Pisones*, *Lentuli*, &c. For there are certain subtil *Corpuscles*, that go out of every (even the smallest) *Part* of the Parents Body, and mingle themselves with the Spirituous Part of the Blood that Circulates through it. Which *Effluvia*, being modifi'd, and as it were figur'd, after a peculiar manner by the Part they come from, impress this Modification upon the fore-mention'd Spirit ; which Spirit, being afterwards united in the Seed with

the *Ideas* of all the other Parts, (that is, the *Spirits* come from every Part with a peculiar Modification impress'd upon them by it) and excited to Motion, and extricated from the grosser Parts of the Seed by the heat of the Womb, begins to form, of its own Substance, a Body like unto that Part, from which it receiv'd the Modifications impress'd upon it. And thus the *prima Stamina* of the *Fœtus* are form'd; which are nourish'd at first by the grosser Part of the Seed, and afterwards, partly by the Mothers Blood, and partly also, perhaps, by the Liquor contain'd in the *Amnos* or inner Membrane of the *Fœtus*. From this Process of Generation, 'tis easie to understand, how that Disposition of some particular Part of the Parents Body, which renders Him or Her obnoxious to any particular Distemper, may be communicated to the same Part of the *Fœtus*, and render it obnoxious to the same Distemper. Only the nature of the *Impression* which is made upon the *Spirit* that forms the Parts of the *Fœtus*, and which qualifies it to form them like the Parts of the Parents Body which it came from; I say, the particular nature of this Modification remains in the dark still. Nor do I know how to illustrate it better, than by
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comparing it to that which is little less obscure than it self; namely, the Modification, *which* the *Rays of Light* receive by being *Reflected* from various Objects, and *by which* they are qualifi'd, to produce, in a darkned Room, lively and distinct Representations of each of those Objects, both as to their Figure and the Colour of their surface; and 'tis from the surface only, that the *Rays* receiv'd this Modification, whereas the fore-mention'd *Effluvia* come from all the innermost Recesses of every Part, and therefore from the correspondent Part of the *Fœtus* like unto it, not only in Figure and Colour, but in the whole Nature and inward Textur of it.

That the *Ideas* of all the Parts do really exist in the Blood, appears from the following Arguments. 1. They have sometimes visibly appear'd in the Blood, receiv'd into a Cucurbit immediately as it flows out of the Vein, (whilst it is warm and turgid with Spirits) for some Medicinal Preparation: See *Borell. Observ.* 2. Some, that have drunk the Blood of any Animal, or of another Man, have been observ'd to partake of the Nature and Disposition of that Man or Animal. *Commodus* his disposition was owing to his Mother,

ther, who, presently after his Conception, drank the Blood of a *cruel Gladiator* that she was desperately in love with. A certain Maid, having drank some *Cats-Blood*, as a Remedy for the Epilepsie, did imitate *Cats* in her voice, motion and Actions, when the Fit was coming upon her ; watching silently at little Mouse-holes. See *Becker. Microcosm.* Therefore (to note that by the way) the Transfusion of Blood seems not a safe way of curing Diseases. 3. The *Spittle* of a *Mad Dog* makes other Dogs, Men, Horses, or any other Animal, wounded by his Teeth, turn mad also, and imitate his Actions and Gesticulations, such as *Barking, Grinning, Fearfulness of Water, &c.* Now *Spittle* is an immediate production of the Blood that circulates through the *Salivary Glandules*, & therefore must have receiv'd from thence the *Ideas*, that it infects the Spirits of the bitten Animal with. Also other *Venemous enraged Animals*, as the *Tarantula*, &c. communicate such *Ideas* by the little Wounds that their Teeth make in the Part they bite, as transform the Spirits of the Party bitten to a ridiculous imitation of their Gesticulations.

Though every particular Part of the *Fœtus* be form'd, as has been said, by the Evolution,

Evolution of its own *Idea*, convey'd, by the Circulation of the Blood, from the Correspondent Part of the Parents Body, unto the *Testes*, where the Seed is made; yet maimed Parents may have perfect Children; namely, if both Father and Mother be not mutilated (at least not of the same Parts;) or if they have had perfect Seed in store, before they were dismembred; or if the defect of the *Architectonic Spirit*, that should have come to the Seed from the Part that is deficient, be suppli'd by the strength of the *Parents Imagination*; who by seeing daily other Infants, Boys, Girls, Men, Women, all perfect, without the defect of any Part, may conceive so firm an *Idea* of a perfect *Fœtus*, as will (by the *Sympathy*, between the *Imagination* and the *Seed*, formerly explain'd) produce the very same Modification in the Seed, that an *Idea*, convey'd by the Blood from the deficient Part, (if it had not been wanting) would have done. For the Mothers Imagination may not only add to the *Fœtus* a *Spot* representing the Thing imagin'd in Figure and Colour, but even the very *Thing it self* in its whole Nature. How many Instances are there of Pregnant Women, that have conceiv'd so strong an *Idea* of the *Horns* of some Beast that has

terrifi'd them, *that* the Impression, thereby made upon the *Fœtus*, has produc'd (not a *Spot* only representing it, but) a real substantial *Horn*, though, perhaps, this Cause of the *Phænomenon* be not always observed. And hence it is, that if the *Parents be maimed from their Birth*, their Children are often mutilated of the same Part, because they cannot easily conceive a firm *Idea* of the entireness of that Part, which they never felt entire in themselves: But if they were *dismembred long after*, they can easily form a strong *Idea* of the Part that they have felt entire, and known the use of, in themselves, and so supply the defect of that *Idea* in the *Seed*. 'Tis also probable, that the *Mothers Imagination* is the principal Cause, why the *Childs Face* sometimes resembles the Fathers, sometimes the Mothers, and sometimes some other Person, according to the *Idea* that is prevalent in the Mothers Brain, while she is with Child.

That the *Mother* (as well as the Father) is furnish'd with *true Seed*, endow'd with the *Ideas* of the Parts of her own Body (as well as the Fathers is with the *Ideas* of his) and consequently, that she does contribute part of the *Plastick vertue* that forms the *Fœtus*, as well as afford the
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Matter of which it is form'd and nourish'd in the Womb, appears from several Parts of the foregoing Discourse, as well as from the three following Considerations. 1. The *Ideas* of the Masculine Seed can only be taken from the Parts of the Mans Body, and therefore can never form the Organs peculiar to a Woman. 2. The vitious Conformation of any Part of the Mothers Body, as well as of the Fathers, is often propagated to the *Fœtus*. 3. When a *Male* and *Female* of differing *Species* copulate, the *Fœtus* is of a mixt kind, resembling the *one* in some of its Parts, and the *other* in others. We have (besides the instance of Mules) too many instances of this in the Monstrous *Fœtus's* produc'd by the detestable Venery of some Men, that copulate with Female Brutes. The flowing of the *Menstruous Blood* to a young Womans Womb, is a *sign of Maturity*, because it signifies, that, besides the Seminal *Idea* of her own Sex (which she was really furnish'd with before) there is now also Aliment provided for the Evolution of that *Idea*, whensoever it comes to be Fœcundated by the Masculine Seed.

Death happens, when the Vital Spirit (or Calidum innatum) that is the chief Mover in the Evolution of the *Ideas*, and in all
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the Animal Functions, is suppress'd or extinguish'd by any Cause whatsoever. (This may be better understood from what was formerly deliver'd of *Abortion*, which is nothing else but the *Death of the Fœtus*.) But the *Ideas* do still remain in the *Cadaver*, though they are become *Barren* for want of the *Moving Spirit*; which shall be restor'd again at the *Resurrection*, and no new Evolution thereby made, but the *entire Idea*, as it was already unfolded at the time of *Death*, *resuscitated* or animated anew. And some of the *Speetres*, that are seen in *Church-yards*, may be nothing else but the *Ideas*, remaining in the *Human Cadavers*, elevated by means of a certain Central Heat, which would be seen in the day time also, if the Light of the Sun did not keep them from appearing. *Serpents*, cut to pieces and *putrefi'd*, breed new *Serpents* by the influence of the *Sun*, which restores to the quiescent *Ideas* that moving *Spirit*, which they had lost by *Death*. *Frogs* also bruise'd, in the *Winter*, and resolv'd into *Mud*, do, upon the same account, revive in the *Summer*. *Ducks*, *putrefi'd*, are reported to breed *Serpents*, and it has been confirm'd to the Author, by a credible eye-witness: whence it evidently appears, that the seminal *Ideas* of the *Serpents*

pents Flesh (which they use to feed often upon) have not been totally destroy'd, even by so many Digestions, but have continu'd entire under the dominion of the Ducks seminal *Ideas*. *Swallows*, when the cold Winter comes, bury themselves under the Water, where they continue without any sign of the least Motion or life, 'till the returning Sun inspire them with new vital Spirit, and thereby raise them to life again. All these Instances do strongly argue the possibility of the *Humane Resurrection*: Which (as also the Authors conjectures about *Spectres*) is likewise much confirm'd by the *Resuscitation of Vegetables*, hereafter mention'd.

Naturalists observe, that, in some Persons, the Passion is so great in time of *Coytation*, that, for the present, it quite bereaveth them of the use of Reason. And therefore it is, (which should have been noted before) that the Parents *Imagination*, at that time, produces more *powerful* Effects in the *Seed*, than the same *Imagination*, at any other time, could have done. For when the Animal Spirits flow in such abundance into the Organs of Generation, any *Idea*, that is very strong in the *Imagination*, must of necessity be carry'd down together with them and infect the *Seed*.

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But I have already insisted too long upon this Subject : And therefore I shall add no more, but pass on to the *Generation of Vegetables*.

Every *Species of Vegetables* has its own particular *Seed*. The *visible Seed* is but the Receptacle, that contains, and secures from External Injuries, the *true Seed* or *Idea* of the Plant, which (says our Author) all sound Philosophers affirm to be but the 2800 parts of its own Body; intimating this determinate Proportion, that in all Generations the *true Seed* is very remote from any sensible bulk. The Seminal *Idea* of every *Plant* (as was formerly said of *Animals*) consists of as many particular distinct *Ideas*, as there are different Parts in the Vegetable, all together representing an exact *Model* of the entire Plant. The Evolution of this *Idea* is perform'd in this manner. When the Body of the Seed, or external *Capsula* of the Seminal *Ideas*, begins to be soften'd by the moisture of the Earth, so that the *Ideas* may take up a larger space, the heat of the *Sun* excites the innate fire of the Seed, which is Congeneal to it; (for all fruitful Seeds are endow'd with a Particle of that universal Spirit of Life, which is the Principle of all Vital Actions, Fœcundates all Seeds,
and

and is the only Mover in all Generations:)
 and which being, put in motion, begins,
 by the Coagulative vertue 'tis endow'd
 with upon the account of its Acidity, to
 Coagulate the Water that is at hand, into
 a Substance agreeable to the nature of the
Ideas, and fill up the little spaces of the
Ideas with it: Which are by this means
 gradually explicated, 'till they have at-
 tain'd the utmost Evolution that they are
 capable of. This Evolution, of the *Ideas*
 of a Vegetable seed, may be clearly repre-
 sented to the Eye by *Artificial Vegetation*,
 which is perform'd in the following man-
 ner, according to *Tachenius*.

Take the ripe *Seed* of any Plant, gather'd
 in fair Weather, bruise it in a Glass Mortar,
 and keep it in a Glass Hermetically seal'd,
 of a shape and bigness answerable to that
 of the Plant, 'till you observe a convenient
 Evening, when *Dew* is like to fall; then
 take out your Seed, and expose it all night
 upon a Plate of Glass, that it may be wet
 with Dew; but be sure to seal it up again
 before Sun-rise, with a solution of the *Salt*
of Dew, in its own distill'd Liqueur pour'd
 upon it to the heighth of three fingers
 breadth. Expose this seal'd Glass to the
 Rayes of the Sun and Moon in fair Wea-
 ther, and keep it in a warm Fire-room in
 rainy

rainy Weather. After some days the *Seed* will appear like a Mucilage, and the supernatant *Dew* will be of a *Green* Colour saturate according to the nature of the seed, and cover'd over with a skin of divers Colours. When these signs are compleat, if you heat the Glass, you shall see a perfect lively *Idea* of the Plant rise up within it, which will disappear again when the Glass is remov'd from the Heat. This odd *Phænomenon* depends upon a Particle of the *Universal Spirit* contain'd in the *Dew*, which excites the *innate Spirit* of the *Seed* to an occult *Fermentation*, whereby the *Idea* is freed from its external earthy Receptacle, so that it may be elevated by the application of external Heat, leaving the heavy terrestrial Particles behind. But the Author does not give credit to the Experiment, that some pretend to, of elevating this *Idea* from the *Ashes* of a Plant; because the Calcination drives away that Spirit, which is the immediate Receptacle of the *Idea* of the Plant. The foremention'd *Salt of Dew* is made by Filtring and Distilling the *Dew* 'till it leave no more *Fæces*, then Calcining the *Fæces*, and Extracting the Salt from them, which is to be dissolv'd in the Distill'd *Dew*, and so pour'd on upon the *Seed*, as above.

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In the last place, *Minerals also are endow'd with Seminal Particles.* For though they be not made up of so many dissimilar Parts, and of distinct Organs, as Vegetables, and especially Animals are; and consequently, though we cannot suppose any *Ideas* in them consisting of Integral Organical Parts: Yet they have a certain *Seminal Ferment*, which, in Metals particularly, is evident enough; for 'tis this Ferment that converts *Mercury into a Metalline Substance.* Therefore, *Iron Mines*, that have been almost quite exhausted, are after some years found as rich in the *Oar* as they were at first. And the same thing is observ'd in *Tin*, (and likewise in *Nitre.*) And such a Seminal Power there is in common *Gold*, though this Metal be unfit to impregnate other Metals therewith, and consequently improper for the Grand Philosophical work of *Transmutation*; because its *Sulphur*, being once Coagulated, loses all Power of Motion for the future, and therefore is unfruitful and dead. But 'twas this same *Seminal Sulphur*, that, when the Gold was produc'd, did Coagulate it self with *Mercury*, and thereby convert it into Gold. And there appears not any solid Reason against the possibility of the *Transmutation* so much sought after; since, though

though *Seeds* cannot be converted into other *Seeds*, yet those, that are endow'd with a *weaker* Mover, may be overcome by, and brought under the Dominion, of such *Seeds* as are furnished with a *stronger*.

And now having establish'd the *Material* and *Formal Principles* of Natural Bodies, the *Efficient* only remains to be consider'd.

Prop. XVIII. *The chief Mover (under God) of all Natural Bodies, that actuates and foecundates all Animal, Vegetable and Mineral Seeds; that Coagulates Elementary Water into all sorts of Bodies, according to the various Ideas of those Seeds; that applies the same Water to those Ideas, and in a word, the chief Efficient in all the Phenomena of Nature, is a certain subtil Spirit of an Igneous nature, diffus'd through the whole visible World, but chiefly treasur'd up at the Center thereof in the Sun.*

N.B. [1. **B**Y Spirit here, is not meant an Immaterial Substance, but a Body consisting of very Minute and very Active Particles, peculiarly fitted for Motion, and endow'd with a great measure of it. 2. By the *visible World*, I understand here, that part of the Corporal

real Universe which contains the Earth with the other six Planets, and makes up one great *Vortex*, whereof the *Sun* is the *Center*. As for the rest of the Universe, it is altogether unknown to us, only, as that most ingenious conjecture of the incomparable *Des Cartes* concerning it, is very likely to be true; namely, that every one of the fixt Stars, we see, is the *Center* and *Sun*, as 'twere, of a distinct *Vortex*: So 'tis no less likely, that each of them has the same relation to its own *Vortex*, and the same Influence upon the Planets, or whatever Bodies they are which it contains, that the Sun has to our *Vortex*, and upon the Bodies comprehended there in particularly the *Terraqueous Globe*. And though this Part of our Authors *Hypothesis* concerning the *Anima Mundi* or *Universal Spirit*, may be applicable in the sense newly explain'd, to the whole Universe of Bodies, yet his other Principles of *Water* and *Seeds* are not so comprehensive; and whatever he says of them, must be limited to the Bodies contain'd in this little Point of the Universe, that the Almighty Creator has given to Mankind for an Habitation. And the truth is, we have but little certain knowledg of the other Parts of the World, and that little we have is very

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superficial.] 3. *This Universal Spirit is actually Igneous in its Fountain, the Sun; and after it is incorporated in Terrestrial Bodies, even the coldest of them, it differs but in the slower Motion of its Particles from actual Fire, and therefore, when-ever they are put into a rapid motion, it turns into actual Fire again. And those Particles of Combustible Bodies, that, being in a vehement Agitation, do chiefly constitute our Culinary Fire, were once Particles of this Universal Spirit, and came Originally from the Sun.* 4. *This is the Spirit that mov'd upon the Water at the beginning of the Creation.* For when God created the Matter of which he intended to form this Teraqueous Globe, namely, a great Mass of simple Elementary Water, he endow'd it with all sorts of Seeds, and made use of this Spirit to Coagulate a great part of the foresaid Mass, according to the Signatures of those Seeds, into Mineral, Vegetable and Animal Bodies of all kinds. [And the Word in the Original, which our Translators render *Mov'd*, seems to agree very well with this Hypothesis: For it properly belongs to Birds sitting upon and fluttering over their Eggs and young ones, to excite, quicken and foecundate the Seed contain'd in the Eggs, and so bring forth the young

young ones ; and to cherish them when they are brought forth: so that, in this place, the Word may be very reasonably suppos'd to imply, that the *Vital Spirit*, which God had Created, did, as 'twere, sit upon, and move it self in the Waters, to actuate the Seeds they contain'd, and by this means Hatch'd, as 'twere, and brought forth the after-mention'd Bodies.] 5. *Tho'* this *Spirit*, by Coagulating the Elementary Water into several Bodies, was it self Coagulated and Incorporated together with it, and *tho'* it has been propagated to all sorts of Bodies that have been produc'd, by Generation, ever since the *Terraqueous Globe* was first Created ; so that every fruitful Seed has a Particle of this *quickning Spirit* connate with it: *Yet* this *Particle* is not sufficient to accomplish the Evolution of the seminal *Ideas*, and actuate the Body in all the Functions that belong to it, unless it be maintain'd, corroborated, and multiplied by constant fresh supplies, from that *Inexhaustible Treasure of this Vital Fire*, which is plac'd in the *Sun*, and thence diffus'd, with the Rayes of that glorious Body, to all Parts of the visible World, and particularly to the *Terraqueous Globe*, where it maintains and actuates the fore-mention'd

Native Spirit of all Animals, Vegetables and Minerals. 6. The *Vital Substance*, that flows continually from the *Sun*, is equally capable of all Forms, and unites it self indifferently with all *Seeds*. But when 'tis once united, it loses its indifferency, and is specif'd according to the determinate nature of every particular *Seed* that it incorporates with. Hence the *Sulphurs* of *Vegetables*, are quite different from those of *Animals*, and both from the *Sulphurs* of *Minerals*; nor can they be transmuted into one another by humane Art: So streightly does the *Universal Spirit* unite it self with particular *Seeds*. The reason of this so close an union, is, because the *Native* pre-existent in every *Seed*, is of the same *Spirit* Nature and Original with this *Universal Spirit*.

As for the Proof of the Proposition hitherto explained, the *Universal Spirit*, asserted in it, is manifest, 1. From the absolute necessity of constant *Respiration* to Men, and most other Animals; for hence it is evident, that there is a certain *Vital Substance* in the *Air*, that they cannot live a Minute without fresh supplies of, now that the *Air* is but the *Vehicle* of this *Vital Substance*, flowing continually from the *Sun*, and the *Medium*, through which it is convey'd

convey'd to sublunary Bodies, shall be prov'd hereafter. So that it must be the *Universal Spirit*, cloath'd with Air, that is constantly receiv'd into the *Lungs* by Inspiration, and thence transmitted to the *Heart*; which (being the chief *Fountain of the Animal Life*, that constantly diffuses a *Vital Spirit* through the Arteries, together with the Blood, to all Parts of the Body, and thereby maintains and cherishes the *Native Heat and Vital Spirit* residing in each of them) must have constant supplies from the *Universal Spirit*, to Corroborate, Maintain, and Multiply its own *Particular Spirit*. For the *Universal Spirit*, that flows from the *Sun* to all Parts of the *Macrocosm*, is of the same Nature with this *Particular Spirit*, that flows from the *Heart* to all Parts of the *Microcosm*, and is therefore very fit to nourish and support it with constant new supplies. 2. The same *Universal Spirit* is no less evident from what has been deliver'd under the former Proposition, concerning the *Generation of Animals*. To which I shall only add, that Nature has solicitously provided to secure the *Seed* from External *Air*, because, if it were expos'd but a moment to the *Air*, the *Universal Spirit*, that dwells there, would instantly suck up (so to speak) the

Congeneal Spirit that foecundates the Seed, as not being yet incorporated. [Wherefore the *Seed*, of *Oviparous Animals*, is carefully shut up from the Contact of the External *Air* within the *Egg*. And in *Viviparous Animals*, presently after the Injection of the *Masculine Seed* into the *Womb*, and the Union thereof with the *Feminine*,] the Orifice of that Part is exactly clos'd, and the two united Spirits do presently fall to Work, and begin the Evolution of the seminal *Ideas*, and the Apposition of Aliment thereunto. But this Work could never be accomplish'd, nay, nor even begun, unless the *seminal Spirit* were excited, cherish'd, corroborated, and supported by the Heat of the *Womb*, [and by constant supplies of the Mothers *Vital Spirit*, convey'd, with the Arterial Blood, from her Heart to the *Placenta Uterina*, and thence transmitted, through the *Umbilical Vein*, into the *Vena Cava*, and so into the *Heart* of the *Fœtus*, which is the *Centre of Evolution*, and the chief *Spring* of all the *Animal Actions*, both in and out of the *Womb*: But no sooner is the *Fœtus* separated from the Mother, and thereby depriv'd of the supplies that the *Vital Spirits*, residing in the *Heart*, receiv'd from her in the *Womb*, than it begins

to

to draw supplies for maintaining of the same *Vital Substance*, from the *Universal Spirit* lodg'd in the *Air*, as was said before.

3. 'Tis the *Vital Spirit* residing in every particular *Part* of the Human, or any other Animals Body, maintain'd by the Influence of the *Universal Spirit* convey'd with the *Air*, by *Respiration*, into the *Lungs*, and from thence communicated, by means of the *Circulation of the Blood*, first to the *Heart*, and, from that, to the *whole Body*;] 'tis this Spirit, I say, that Coagulates the Fluid Blood into the solid substance of that Part, and is the true Efficient of all the Vital Functions belonging to it. [Those Animals that are destitute of Lungs, are nevertheless endow'd with Organs of Respiration of an equivalent use. For that excellent Anatomist, *Malpighius*, has happily discover'd, that those *blackish Points*, which we observe in *Insects*, all along the length of their Body, on both sides, are really the *Orifices* of so many *Tracheas* or *Wind Pipes*, which convey the *Air* into the Stomach, Spinal Marrow, and all the other *Bowels*, as well as the *Heart*, so that the *Air* has immediate access to feed the *Vital Spirit* that resides in each of them, because there is no *Circulation* of the Alimentary Juice in these Ani-

mals; or if there be, it is too slow to convey sufficient supplies of the *Universal Spirit* from any one Part to all the rest, as it doth from the Heart and Lungs in perfect Animals. And the constant ingress and egress of the Air by these little *Holes*, is so necessary to the life of *Insects*, that if you immerge their whole Body into *Oyl*, or but anoint these little spots with it, they presently *dye*; whereas if you anoint only the Intervals with *Oyl*, without touching these little Holes, they receive no harm. And tho' *Fishes* have no Lungs nor Air Pipes, because they live in the *Water*; yet instead thereof they have *Gills*, which are Dilated and Contracted by a perpetual Reciprocation, to give ingress and egress to the *Water*, as the *Lungs* of other Animals are to Inspire and Expire the *Air*. Nor can *Fishes* live without *Water*, any more than *Land-Animals* can do without *Air*. Whence 'tis highly probable, that the *former* receive constant supplies of some *vital Substance* from the *Water*, as well as the *later* do from the *Air*: especially if we farther consider, that the *Vital Liguor* Circulates through the *Gills* of the *one* by the Ramifications of their *Arteria Bronchialis*, as well as it do's through the *Lungs* of the *other* by those of the *Arteria*

teria Pulmonaris. Wherefore, if in *Land-Animals* the said *Vital Liquor* divide it self into little Rivulets in its passage through the *Lungs*, that every part thereof may at each *Circulation* receive fresh supplies of *Vital Spirit* from the *Air*, that is diffus'd through the whole substance of those *Respiratory Organs*, by the numerous *Ramifications* of the *Wind-pipe*; if this be so, I say, (as we formerly prov'd it to be) we may very reasonably suppose, that in *Fishes* the same *Vital Liquor Circulates* in like manner through the *Gills*, that it may receive constant fresh supplies of a *vital substance* from the *Water*, that washes the *Gills* perpetually. N. B. The *Gills* of *Crust-ed Fish*, as *Lobsters*, &c. and of *Shell-fish*, as *Oysters*, &c. are *spongiuous*, and not only receive the *Water* into all their innermost parts (where it communicates with the numerous *Vessels*, that diffuse the *Vital Liquor* through the whole substance of the *Gills*) but give it a *Passage* also into all the *Internal Cavities* of the *Body*, where it is laid up as in *Bottles*, to supply the foresaid *Fishes* with *Vital Spirit*, when the *Ebbing* of the *Sea* leaves them in *secco*: whereas the *Gills* of *sanguineous Fishes* that live constantly in the *Water*, are not *spongiuous*, and the *Water* washes only

ly their outward surfaces without penetrating any farther. But instead of enlarging any more upon this point, I shall refer the curious Reader to Dr. *Willis's Book of the soul of Brutes*, Chap. 3. where he will find it very fully and accurately handled.] 4. The Existence of an *Universal Spirit* is evident from what has been said concerning the Growth of *Vegetables*. For 'tis a Particle of this *Spirit* in the seed, excited, strengthn'd and maintain'd by the *Sun's Vital Influence*, that *Explicates* the *Seminal Idea*, and *Coagulates* the *Water* into solid substances, as *Wood*, *Bark*, &c. which could never be produc'd out of simple *Water* without this *Coagulating Spirit*. 5. The same Argument may with equal, if not greater, force be applied to *Minerals*, and especially to *Metals*, which, tho' they be the solidest substances yet known, are nevertheless made of *Mercury*, which of all *Liquors* is the most fluid.

In the next place, To evince that *the Sun is the chief Fountain of this Universal Spirit*, I need only put the Reader in mind of what was formerly observ'd concerning *vegetable seeds*; namely, that they would be perpetually barren, if their *Native Spirit* were not actuated by that vital substance

stance which is every where diffus'd with the *Rayes of the Sun*. But to confirm this a little farther, 'tis evident beyond contradiction, that *the Growth of Vegetables depends upon the Influences of the Sun*, since the different Seasons of the Solar Year have so constant and so powerful Effects upon them. For in *Winter* the Influence of the Sun is very weak, because of the Obliquity of his Rayes, and the shortness of the dayes : and therefore *Seeds* lye dormant in the Earth without any motion : *Herbs* fade and wither, or dye totally : *Trees* are depriv'd of their Leaves and lively Verdure, shoot forth no Twigs, produce no Blossoms, bear no Fruit, and in a word cease from all Vital Actions. Yea many *Animals* themselves loose much of their Vigour, and some of them (such as *Flyes, Frogs, Swallows, &c.*) lye dead, as it were, all the Winter long, in Chinks of Walls, or in Cavities of the Earth, or under Water, without any motion, Sense, or the least appearance of Life : But when the *Sun* comes to be more *vertical*, and the Dayes grow longer, every thing capable of Life is quickn'd or reviv'd ; and the whole Face of the Earth, that look'd dead and lifeless before, appears fresh, verdant, lively, and quite new, insomuch that

that 'tis astonishing to behold so vast an alteration: the *Vital Spirit* remaining in the Roots of such *Herbs*, as did not quite dye in the preceeding Winter, being Reviv'd, Excited to Motion and Corroborated, falls to work afresh, and produces new Stalks, Leaves, Flowers, Seed, Fruit, &c. the *Vital Spirit* that had in a great measure retir'd from the Branches of *Trees* into their Roots and Body, explicates it self anew, restores their fresh and lively Verdure, and adorns them with new Leaves, Twigs, Buds, Blossoms, Fruit, &c. Finally the *Vital Spirit* of the forementioned *Animals*, that had Concentred it self in the middle of their Body, actuates the Members anew which it had before deserted, and restores to them Sense, Motion, and the Exercise of all their Vital Functions.

Lastly, The *Universal Spirit* appears to be of an *Igneous Nature*, 1. Because it flows from the *Sun*, which is an actual *Fire*. Yea the *Solar Rayes* themselves, which diffuse this Vital Substance through the Visible World, being Collected by a Burning Glass into a Center, produce all the Effects of our *Actual Culinary Fire*. [2. The *Vital Spirit* of *Animals* is fed by the *Universal Spirit*, as has been evident-ly

ly prov'd, and by consequence is of the same Nature with it. Now this *Vital Spirit*, in *Hot Sanguineous Animals*, has all the *Essential Properties of an Actual Flame*: For it constantly diffuses a sensible *Heat* through all the Members of the Body: it is maintain'd by constant fresh supplies of *sulphureous Fuel* from the *Aliments*, that are taken into the Stomach and thence conveyed to the Blood, where this subtil Flame invisibly burns; and of an *Aerial Pabulum* from the *Air*, that is taken into the Lungs by Inspiration, and there communicated to the same Liquor: it constantly emits *Fetiginous Effluvia*, both through the *Wind-Pipe* also through all the *Pores of the Skin*, which are like so many *Chimneys* appointed to ventilate this vital Fire: It is kindled first in the *Seminal Liquor*, either by another vital Fire, as in *viviparous Animals*; or by the *Intestine Motion of the Sulphureous Parts*, excited and cherished by a continu'd External Warmth, as in *Oviparous Animals*: but so long as the *Fœtus* is included in the Womb or Egg, it burns very faintly, and never breaks out into an actual Flame till the *Air* have free access to it by Respiration: finally it dyes as soon as it is depriv'd of *Sulphureous Fuel*, of *Aerial Pabulum*, or of *Ventilation*. Now these

these Properties seem to be peculiar to Flame: and particularly there is nothing we know of in the World besides *Life* and *Fire*, whose Motion is instantly suppressed by withdrawing the Air. See *Willis de Accentione Sanguinis.*]

Prop. 19. *The Universal Spirit, that Coagulates Elementary Water into Solid Substances of the Animal Vegetable and Mineral Kingdoms, consists of Acid Particles.*

For 1. **I**T is of an *Igneous* nature; and Fire has been prov'd to consist of *Acid* Particles put into a rapid Motion.
 2. All Chimiſts agree that *the Concretion of Bodies depends upon the Saline Principle.* Now *Alcaline Salts* are apt rather to *Dissolve* Bodies, than either to Coagulate or be Coagulated: Whereas we have a multitude of Instances of Coagulation and Fixation perform'd by *Acid Salts*; which tho' they Corrode (and so Dissolve) many Bodies, yet their Property is to *Concoagulate* with the Bodies they have Corroded. [Thus *Quicksilver* is *Fixed and Coagulated* by the *Acid Particles* of common or Antimonial Sulphur, into *Cinnabar*; by those of Salt and Vitriol into *Sublimate Corrosive*;

Corrosive; by Spirit of Nitre into *Red Precipitate*, as the Chymists abusively call it; by Oyl of Vitriol, Oyl of Sulphur, or Oyl of Alum into *Turbith Mineral*, finally by the *Acid* Particles of Fire into *Precipitate per se*. These Instances are the more pertinent to our purpose, because Mercury is a more Fluid Body than Simple Water it self. And the last of them, tho' at first it appear somewhat Paradoxical, yet upon better examination it seems to be very reasonable; *since Precipitate per se*, as well as the rest of the newly mentioned *Preparations of Quicksilver*, may be *reviv'd* into running Mercury, by being distill'd from Salt of Tartar, Quick-lime, or such other *Alcalisate Bodies* as are very apt to be wrought upon by *Acid* Salts, and thereby to disengage the Quicksilver that was Coagulated with them: and *since* the Particles of Fire (which have been prov'd to be *Acid*) may penetrate Glass, and many times increase the weight of the inclosed Bodies, as Mr. Boyle has undeniably evinced by a great many Experiments: and finally *since* Fire is the only Agent in this Preparation:] The Sulphur of Lead deprives *Quicksilver* of its Fluidity. Volatil *urinous* Salts are so powerfully *fix'd* by *Acid Spirits*

rits as to endure an open Fire for some time; but they recover their former volatility, as soon as they are disengaged from the *Acid* Salts that fixed them, by the addition of any Alcalisate Body. All sorts of *Acid* Salts do coagulate *Milk*: and the Coagulation of the Creamy parts of *Milk* into *Butter*, depends upon the internal *Acid* of the *Milk*; for if you throw any Alcalisate Salt into it, there can be no *Butter* obtain'd from it. The *Acid* Salts of *Nitre* do so powerfully fix the vomitive *Sulphur* of *Antimony*, as to render it a good Diaphoretic. [The *Acid* of Spirit of *Wine* instantly Coagulates *Spirit of Urine*; for, if both these Liquors be highly rectified, as soon as ever you have mingled them, the whole mixture loses its Fluidity, insomuch that tho' the Glass be inverted, not one drop will fall out: yea our Author affirms that] if Spirit of *Wine* highly rectified be kept for some months upon Salt of *Urine* in a gently digestive heat, they will unite together into a *Calculus* of a reddish Colour: and (which is yet more strange) four parts of this Stone will convert one part of new Spirit of *Urine* into its own Substance, and four parts of this one more, and so on without any end: and that the Stone in the
Bladder

may be Generated after the same manner by the Plaistick Vertue of an Internal *Acidum*, joyned with the Salt of Urine, and being mixt with Gravel by Fermentation, concentrates into a Concreate Substance. We found by a Stone being taken out of a Humane Bladder, and Anatomized, by Distillation, to consist of Oyl, Spirit, and Volatile Salt, with a very large *Caput Mortuum*: but of this we shall say no more at present, but leave the Reader to judge what may be gathered by the foregoing Experiment; so that it's believed, the Universal Spirit that Coagulates Elementary Water, as well as other Bodies into solid Substances, consists of *Acid Particles*.

F I N I S.

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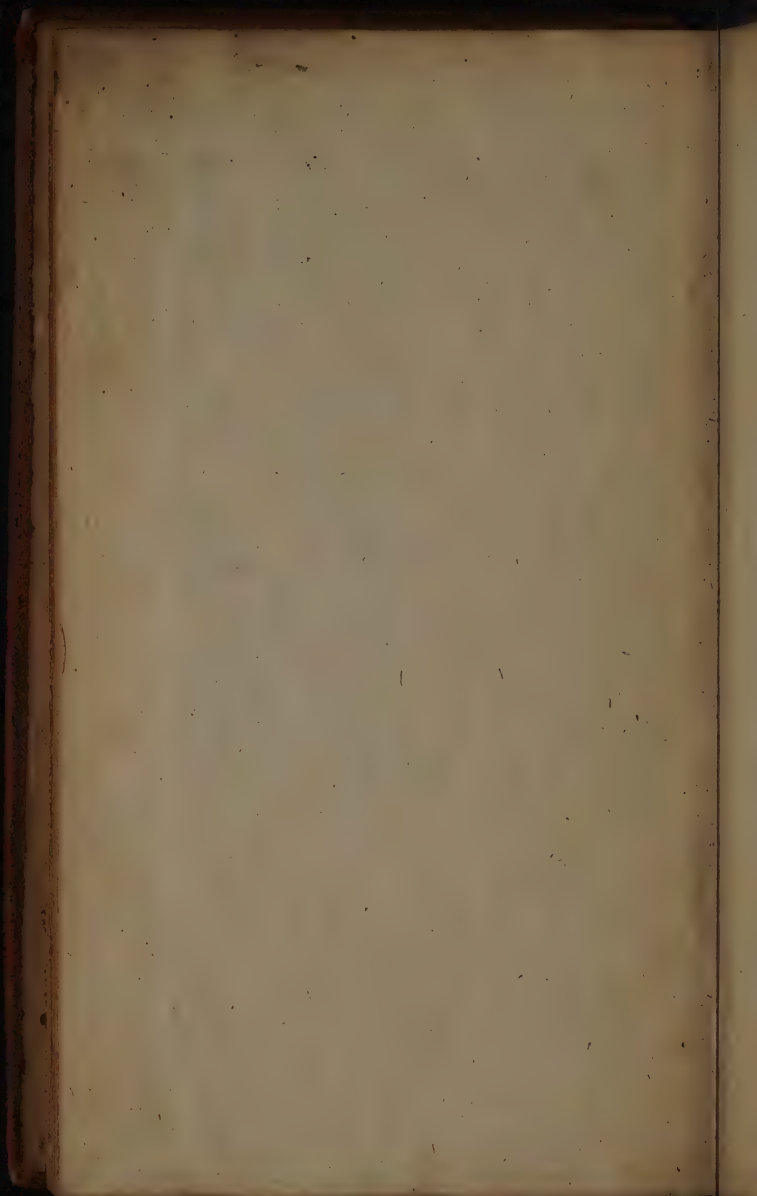
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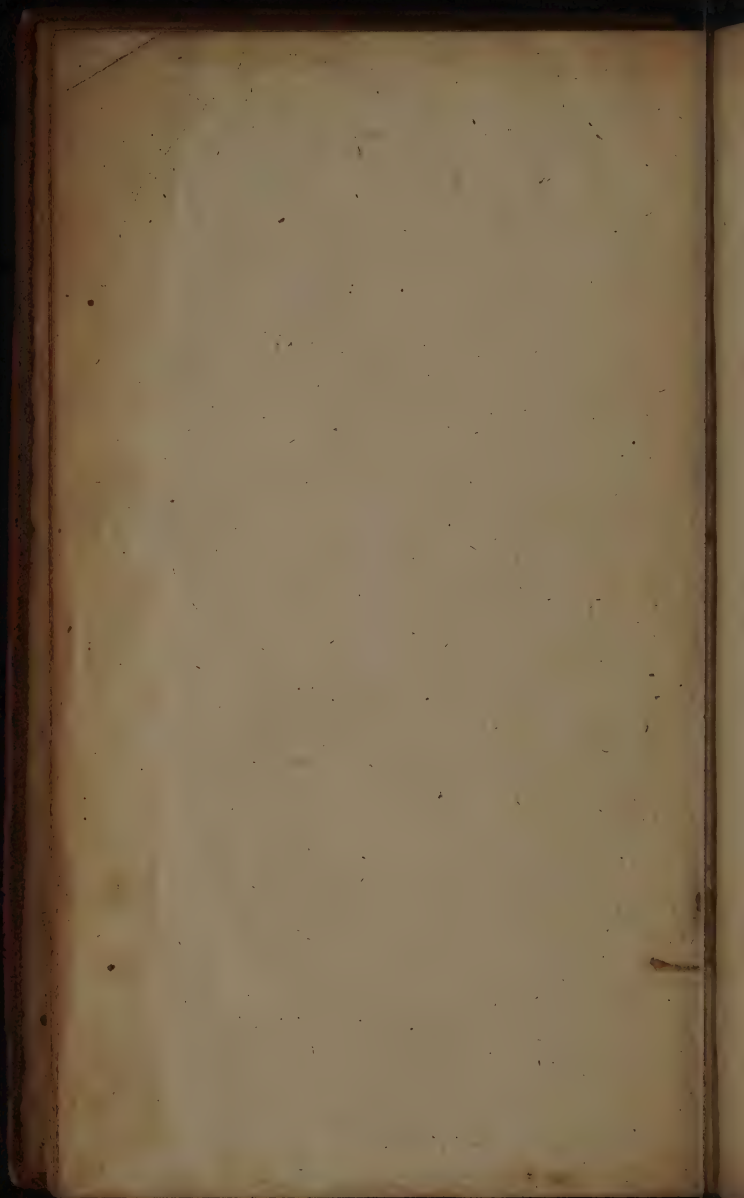
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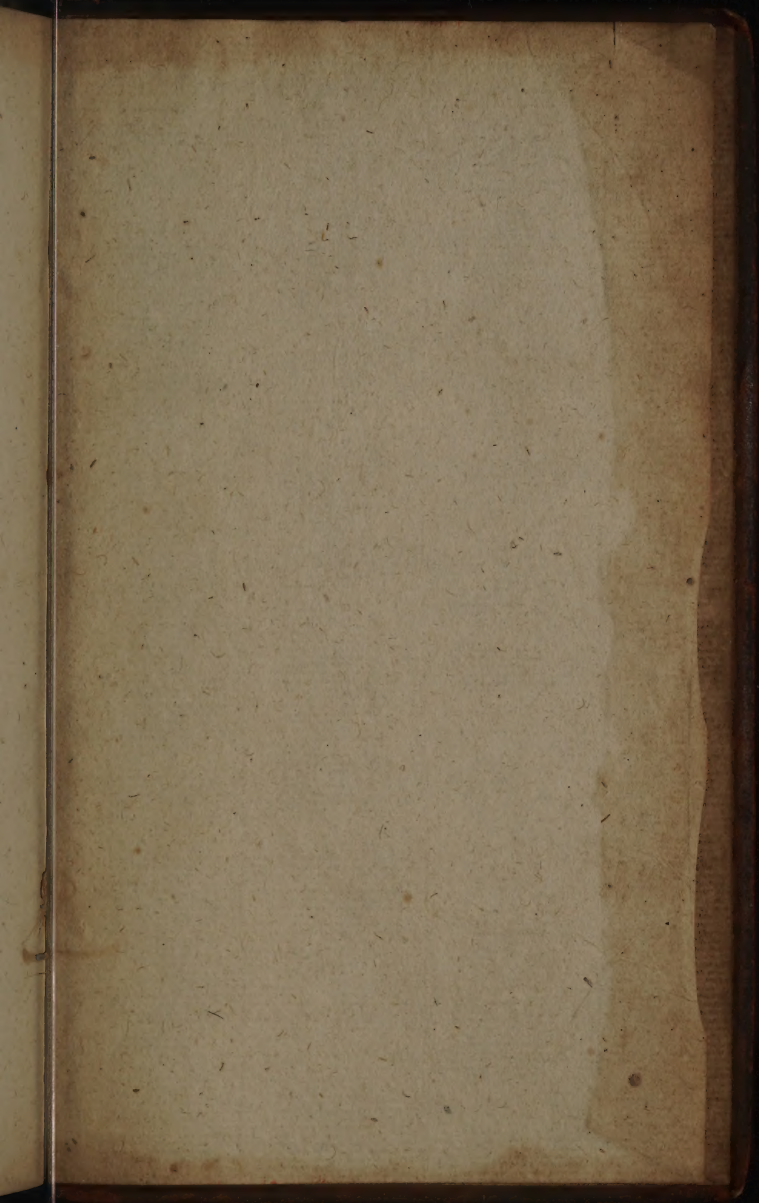
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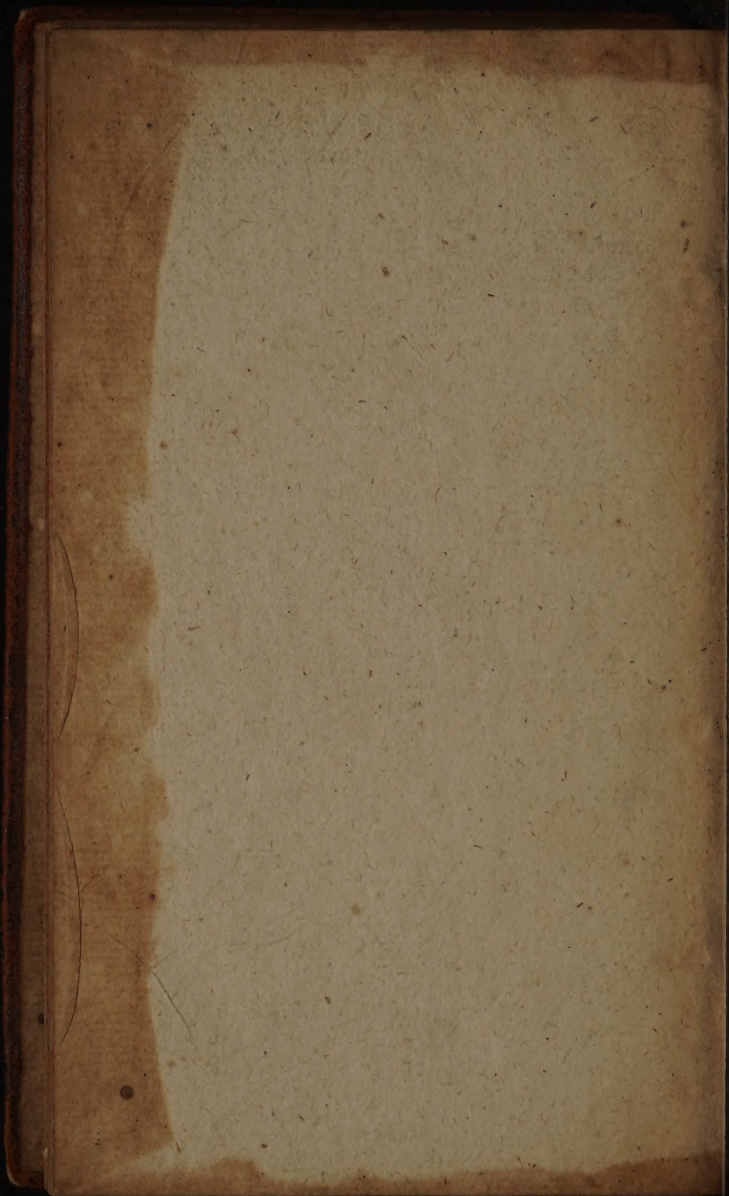
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